بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

The predictive value of urinary trypsinogen-2 dipstick for early diagnosis of acute pancreatitis in intensive care

A Thesis

Submitted for partial fulfillment of master degree
in General Intensive Care

By

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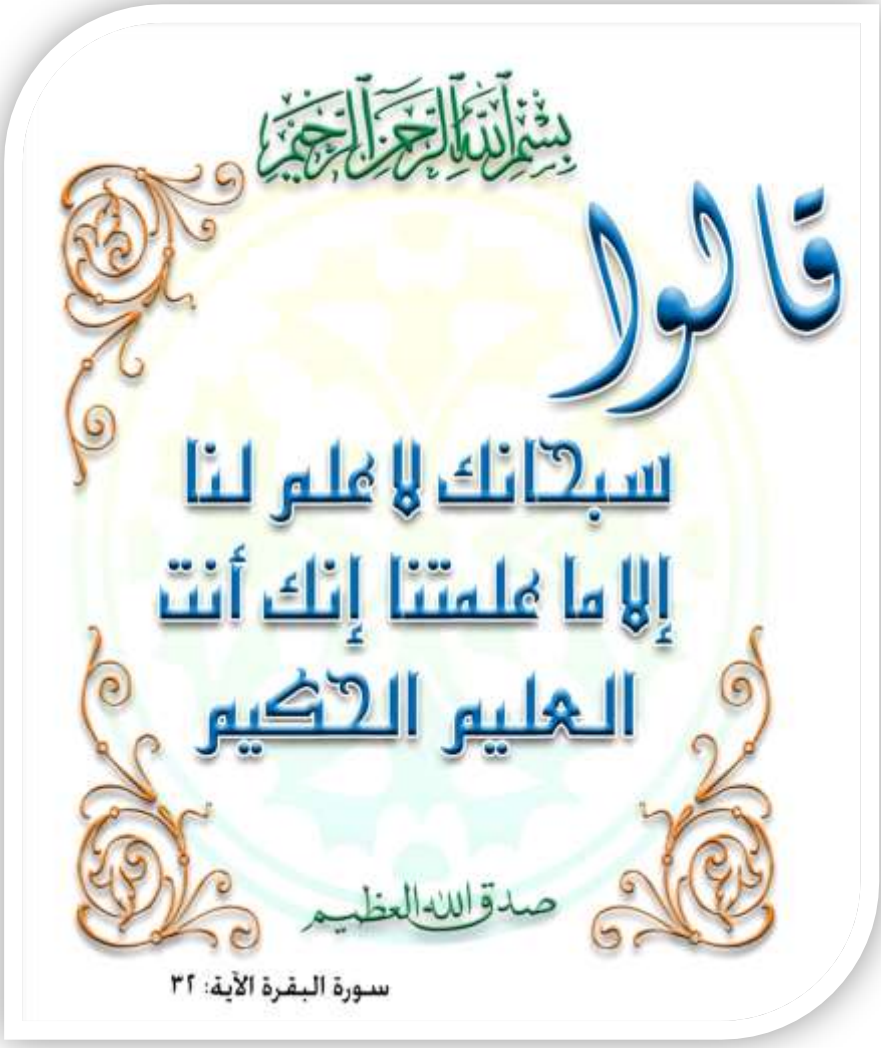
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✍ *Mohamed Magdy Mohamed Ammar*

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List of Abbreviations

Abbr.	Full-term
ALP	**:** Alkaline phosphatase
ALT	**:** Alanine transaminase
AP	**:** Acute pancreatitis
AST	**:** Aspartate transaminase
CBC	**:** Complete blood count
CE	**:** Contrast enhanced
CECT	**:** Contrast-enhanced computed tomography
CFTR	**:** Cystic Fibrosis Transmembrane Conductance Regulator
CKD	**:** Chronic kidney disease
CNP	**:** Chloro-4-nitrophenyl-α-D-maltotrioside
CRP	**:** C-reactive protein
CT	**:** Computerized tomography
DM	**:** Diabetes mellitus
EGDT	**:** Early goal-directed therapy
EN	**:** Enteral nutrition
ERCP	**:** Endoscopic retrograde cholangiopancreatography
ES	**:** Sphincterotomy
EWS	**:** Early warning score
FNA	**:** Fine needle aspiration
HES	**:** Hydroxyethyl starch
ICAM-1	**:** Intercellular adhesion molecule-1

IL-1b : Interleukin-1b
INR : International normalized ratio
LFT : Liver function tests
MAP : Mild acute pancreatitis
MOD : Marshall Organ Dysfunction
MODS : Multiple organ dysfunction syndrome
MRCP : Magnetic Resonance Cholangio-Pancreatography
MRI : Magnetic resonance imaging
MSAP : Moderately severe acute pancreatitis
NG : Nasogastric
NJ : Nasojejunal
PAF : Platelet activating factor
PAP : Pancreatitis-associated protein
PAR : Protase-activated receptor
PC : Prothrombin Concentration
PMN : Polymorphonuclear
PN : Parenteral nutrition
PSTI : Pancreatic secretory trypsin inhibitor
PT : Prothrombin
PT : Prothrombin time
RAC : Revised Atlanta classification
RCT : Randomized control trial
RFT : Renal Function test
ROC : Receiver Operative Characteristics
SAP : Severe acute pancreatitis

SD **:** Standard deviation

SIRS **:** Systemic inflammatory response syndrome

SPINK1 **:** Serine protease inhibitor Kazal type 1

SPSS **:** Statistical package for social science

TAP **:** Trypsinogen activation peptide

TNF-α **:** Tumor necrosis factor-a

TPS **:** Trypsinogen

TPS-1 **:** Trypsinogen-1

TPS-2 **:** Trypsinogen-2

TPS-3 **:** Trypsinogen-3

US : Ultrasonography

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Introduction

Acute pancreatitis is a sudden inflammation in the pancreas, with potential and variable involvement of adjacent organs or other organ systems.

Gallstones and alcohol are the leading causes of acute pancreatitis. Approximately 50% to 70% of cases are caused by gallstones. Older age, lower socioeconomic class and male gender are correlated with a higher incidence of acute pancreatitis ***(Roberts et al., 2013).***

Also, acute pancreatitis can result from mechanical ampullary obstruction, penetrating peptic ulcers, mumps infection, abdominal trauma, post endoscopic retrograde cholangiopancreatography (ERCP) occurring in 1-15% of patients undergo this procedure ***(Woods et al., 2010).***

Acute pancreatitis could be classified as mild, moderately severe, or severe according to Revised Atlanta Classification (RAC) for acute pancreatitis severity ***(Banks et al., 2013).***

Acute pancreatitis is known to be triggered because of extra pancreatic origin but irrespective of the etiology, premature activation of trypsin within the pancreas is considered common feature at the acinar cell level. So, trypsinogen-2 and also the trypsin-2-α_1-antitrypsin complex are accurate diagnostic markers of acute pancreatitis. However, comparisons with amylase are

biased by the fact that amylase is routinely used as a major diagnostic criterion for acute pancreatitis ***(Mishra et al., 2019).***

There are three trypsinogen (TPS) isoenzymes, which are cationic (TPS-1), anionic (TPS-2) and a minor isoenzyme (TPS-3). Amylase and lipase secreted by the acinar cells of the pancreas are the most common laboratory markers used to establish the diagnosis of acute pancreatitis ***(Paju and Stenman et al., 2006).***

In acute pancreatitis, trypsinogen-2 levels usually rise to high levels within a few hours and fall within three days ***(Matull et al., 2006).***

Elevated amylase and lipase levels can be non-specific, depending on the time since onset of pain, other intra-abdominal processes, and concomitant chronic diseases such as renal insufficiency ***(Sutton et al., 2009).***

Ultrasonography is used in the diagnosis and assessment of imaging of organs and soft tissue structures. Due to its non-invasive nature and continuing improvements in imaging quality, ultrasound imaging is achieving a key role in assessment of pancreas. It can diagnose pancreatitis and exclude other causes of acute abdominal pain. With increasing operator experience and advances in technology ultrasonography can evaluate pancreatitis in majority of cases ***(Bhatt et al., 2017).***

Diagnosis of acute pancreatitis depends mainly on clinical diagnosis, but computerized tomography (CT) scan is required to differentiate mild acute pancreatitis from severe necrotic pancreatitis ***(Dimastromatteo et al., 2017).***

The local and systemic inflammatory response resulting from acute pancreatitis leads to fluid depletion in the form of vomiting, reduced oral fluid intake, third-space fluid loss, and increased insensible losses in sweat and respiration. Fluid replacement in acute pancreatitis can be undertaken using crystalloid, colloid, or a combination of both. Ringer's lactate is the preferred crystalloid fluid ***(Wu et al., 2011).***

Acute pancreatitis results in the rapid metabolism of fat and protein due to the hypercatabolic state. Nutritional support aims to provide adequate caloric intake and modulate the oxidative stress response during the initial phase of acute pancreatitis, thereby counteracting the catabolic effect ***(McClave et al., 2012).***