تقييم مرضى العناية المركزة بمقياس الفشل المعدي المعوي بمفرده وبجمعه مع مقياس فشل وظائف الأعضاء التتابعي

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توطئة للحصول على درجة الماجستير

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ABSTRACT

Introduction

The gut plays a major role in critical illness .Gastrointestinal problems occur frequently and are associated with an adverse outcome in critically ill patients despite that, gastrointestinal (GI) function is not included in any of the widely used scoring systems assessing organ failures in critical illness.

Monitoring of intra-abdominal pressure (IAP) is gaining more and more popularity in everyday clinical practice. Several studies have demonstrated an impact of intra-abdominal hypertension (IAH) on mortality.

With the goal of developing a scoring system for GI failure, Reintam et al combined GI symptoms and IAH into a five-grade scale – the Gastrointestinal Failure Score and tested it among critically ill patients in Estonian intensive care unit.

Aim of the study: Our study is to evaluate the GIF score in our Egyptian intensive care units regarding validity and impact on mortality and comparing this with the SOFA score. And to describe the prevalence of food intolerance and intra-abdominal hypertension among ICU patients and their impact on mortality.

Patients and methods: We studied 109 mechanically ventilated patients day one admitted to the general ICU of Kasr El Aini Hospital and Theodor Bilharz Research institute in the period from March 2009 to November 2009.The SOFA+GIF score was calculated each day by summarizing the SOFA score and the GIF score of the respective day in each patient

Results: FI developed in 35.8%, IAH in 26.9% and both of them together in 14.7% of all patients. Compared to patients with mean GIF=0, patients with mean GIF higher than 0 and lower than or equal 2 and mean GIF higher than 2 show higher ICU mortality (100%, 81.4% vs 48.2% P value 0.0001respectively. The GIF score integrated into the SOFA score allowed a better prediction of ICU mortality than the SOFA score.

Keywords: failure, gastrointestinal, hypertension, intra-abdominal, SOFA

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List of Abbreviations

ΔSOFA……..... difference between SOFA 3rd day and SOFA 1st day

ABI ……..……..…….. acute bowel injury

ACS ……...…..……..…..abdominal compartment syndrome

ALI…….……..….acute lung injury

ANOVA ……...……..……..……..Analysis of variance

APACHE ….....Acute Physiology and Chronic Health Evaluation

APP……..……....……. Abdominal Perfusion Pressure

AUROC…….area under the receiver operator characteristic curve

BMI …….……..……...body mass index

CCK……cholecystokinin

Coag……...……..…….coagulation

CPP……..……cerebral perfusion pressure

CPR…….……cardiopulmonary resuscitation

CVP ……...…..……..……central venous pressure

CVS……..……..……. cardiovascular system

df……..……..degree of freedom

EN……...……..……...…..enteral nutrition

EVLWI …….……extravascular lung water index

FG……..……. filtration gradient

FI ……..……..……...……food intolerance

GALT……..……...….gut associated lymphoid tissue

GI……..……..……gastrointestinal

GIC……...gastrointestinal complications

GIF……...……...……..…...gastrointestinal failure

GIT……..……..……..gastrointestinal tract

GFP……..…… glomerular filtration pressure

ICP ……...…..…intracranial pressure

ICU……...……...……..….intensive care unit

IAH..…….……intra-abdominal hypertension

IAP ……..……...……..……...intra-abdominal pressure

MAP ……...……..…….…..mean arterial pressure

Max GIF…..……..... maximum GIF score in the 1st 3days

Max SOFA..……...……maximum SOFA score in the 1st 3days

MODS …..…….....…..Multiple Organ Dysfunction Score

MOF ……..……...……..……..multiple organ failure

MSOF ……..……..multisystem organ failure

MPM …..…….…..……Mortality Probability Model

Neuro…….…….…… central nervous system

OR……Odd ratio

PEEP…..……...…..…….positive end-expiratory pressure

Pt……..…….…..patients

PTP……... proximal tubular pressure

PYY …….…….…. pancreatic peptide YY

OBFI …….. organ blood flow/cardiac output

OR…….....……..……odds ratio

PIP ….……..…..…….……... peak inspiratory pressure

PN……...…….……...Parenteral nutrition

ROC ……..…….…….Receiver Operator Characteristic

SAPS…….....…...….... Simplified Acute Physiology Score

SIRS……..Systemic Inflammatory Response Syndrome

SOFA……..……Sequential Organ Failure Assessment

TBRI ..…….……Theodor Bilhars Research Institute

WSACS……....World Society of Abdominal Compartment Syndrome

95% CI ……..…….……..95% confidence interval

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INTRODUCTION

The ability to accurately predict the outcome impacts medical therapy, triaging, end-of-life care, and many other aspects of ICU care [1].

The literature shows that prognosis have constituted an important dimension of critical care, as patients and their families seek predictions about the duration and outcome of illness [2].

The gut plays a major role in critical illness. Gastrointestinal problems occur frequently and are associated with an adverse outcome in critically ill patients [3,4] despite that, gastrointestinal (GI) function is not included in any of the widely used scoring systems assessing organ failures in critical illness.

The underestimation of the importance of gastrointestinal failure (GIF) in critically ill patients can be seen in its lack of clear definition. Numerous mostly primarily diagnosis-based definitions have been used by different authors, making comparative interpretation of studies upon GI function rather difficult if not impossible [5].

More than ten years ago the summary of round table conference in gut dysfunction in critical illness concluded that intestinal function is an important determinant in the outcome of critically ill patients; there is no objective, clinically relevant definition of intestinal dysfunction in critical illness; and the definition developed in the future should grade the severity of the dysfunction [6].The scoring system for GI dysfunction is thus warranted, while the continuing lack of systemized approach is restricting the studies assessing epidemiology, time course, risk factors and treatment.

Monitoring of intra-abdominal pressure (IAP) is gaining more and more popularity in everyday clinical practice. It is easily performed and results in a reliable value to interpret. Several studies have demonstrated an impact of intra-abdominal hypertension (IAH) on mortality [7,8]. Still, IAP has not been proven to be an adjuvant measure of GI function.

With the goal of developing a scoring system for GI failure, Reintam et al [9] combined GI symptoms and IAH into a five-grade scale – the Gastrointestinal Failure Score and tested it among critically ill patients in Estonian intensive care unit.

Similar to other organ failure scores, the validation of the score was designed as an assessment of mortality in patients with different scores.

Our study is to evaluate the GIF score in our Egyptian intensive care units regarding validity and impact on mortality, and the prevalence of food intolerance and intra-abdominal hypertension among ICU patients and its impact on mortality. And comparing this with a well known scoring system for predicting mortality.

AIM OF THE WORK

The aim of the study is to:

- Describe the frequency of gastrointestinal failure in the ICU according to the GIF score.
- Testing the ability of the GIF score to predict mortality and comparing that with the SOFA score.
- Testing the ability of the GIF score added to the SOFA score to predict mortality.

GASTROINTESTINAL SYSTEM FUNCTION AND DYSFUNCTION

1- GASTROINTESTINAL MOTILITY.

I) Upper Gastrointestinal Motility In Health

Appreciation of the pathophysiology observed in critical illness requires an understanding of normal gastric and small intestinal motility.

In health, the rate of gastric emptying is regulated via an integration of motor activity [10]. The motor activity of the gut differs between the fasting and fed state.

Fasting motility is divided into three phases which migrate along the upper gut (the migratory motor complex); phase Ⅰ is characterised by quiescence, phase Ⅱ by irregular contractile activity and phase Ⅲ by periods of regular contractions sometimes referred to as the activity front [11].

Ingestion of nutrients results in a postprandial pattern of activity. The proximal stomach acts as a reservoir with the fundus relaxing. Subsequently, the fundus undergoes slow sustained contractions, which may act to distribute contents distally and is believed to have a major role in the control of liquid emptying [12]. The peristaltic wave is dependent on the integration of motor activity in the proximal and distal stomach, as well as the proximal small intestine [13].

Transpyloric flow occurs as a result of both peristaltic and non-peristaltic antro-duodenal gradients [14]. The rate of transpyloric flow

is regulated by feedback from receptors in the small intestine [15]. This results in decreased transpyloric movement of nutrient and limits its delivery into the small intestine to 2-3 kcal/min [10].

II) Upper Gastrointestinal Motor Dysfunction In Critical Illness

Delayed gastric emptying is common in the Intensive Care Unit, occurring in approximately 50% of mechanically ventilated critically ill patients [16,17].In these patients both fasting and fed motility of the upper GI tract are frequently impaired [18].

There is a virtual absence of gastric phase Ⅲ motility during the fasting state, although the frequency of phase Ⅲ activity in the duodenum appears normal [19] perhaps reflecting a loss of integration within the antro-pyloro-duodenal unit.

During feeding, however, a number of additional abnormalities become apparent. These include delayed fundal relaxation, prolonged recovery [20], reduced antral motility [18] and increased isolated pyloric activity. These occur when the small intestine is exposed to even low levels of nutrients and are likely to result in delayed gastric emptying [18].

In contrast to delayed fundal relaxation and impaired antral motility, duodenal activity usually persists [18] (although the organization of duodenal activity is frequently abnormal) [21].

The mechanisms underlying motor dysfunction in critical illness are uncertain. However, concentrations of cholecystokinin (CCK) and pancreatic peptide YY (PYY), which normally increase when nutrient