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LETTER

Severity Prediction in Acute Pancreatitis Using the CT Severity Index. A Self-Fulfilling Prophecy

Jan J De Waele, Stijn I Blot

Intensive Care Unit, Ghent University Hospital. Ghent, Belgium

Dear Sir:

We read with interest the paper by Gürleyik *et al*. [1] and the subsequent letter by Brestas and Dafni regarding the use of ROC curve analysis [2]. We fully agree with Dr. Brestas that ROC curve analysis should be used to report the true discriminative power of a test, and are impressed by the performance of the CT severity index in predicting severe disease which was reported in reply to this letter.

There is however another very important bias when using the CT severity index, as introduced by Balthazar *et al*. [3], to predict disease severity. When a test or score is used to predict a disease state, two crucial elements must be taken into account. Firstly, the disease state to be predicted is not (yet) present (otherwise it should not be a prognostic indicator), and secondly, the disease state to be predicted is not included in the score under study.

This is why the CT severity index has a critical defect. The presence of pancreatic necrosis is the most important component of the score (Table 1). But also in the Atlanta criteria, the presence of necrosis automatically puts the patients in the "severe disease" category. It is completely illogical to measure the presence of a complication on CT scan (necrosis in this case) and then state that by measuring the complication you could predict it. This is a self fulfilling prophecy, which clearly has no use in daily clinical practice.

This may explain the extremely high AUC as reported by Dr. Gürleyik *et al*. [1] and similar seemingly good correlations by others in the past [4, 5, 6, 7, 8].

From this, it is obvious that the CT severity index can be used to predict mortality, but as long as pancreatic necrosis is part of the criteria for disease severity, this score should not be used to predict disease severity as defined by the Atlanta criteria.

Table 1. Components of the CT severity index.

Pancreatic inflammation	
Normal pancreas	0
Focal or diffuse enlargement of the pancreas	1
Intrinsic pancreatic abnormalities with inflammatory changes in peripancreatic fat	2
Single, ill-defined fluid collection or phlegmon	3
Two or more poorly defined collections or presence of gas in or adjacent to the pancreas	4
Pancreatic necrosis	
None	0
Less than or equal to 30%	2
Greater than 30 and less than, or equal to, 50%	4
Greater than 50%	6

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Correspondence
Jan J De Waele

Intensive Care Unit
Ghent University Hospital
De Pintelaan 185
9000 Ghent
Belgium
Phone: +32-92.402.775
Fax: +32-92.404.995
E-mail: jan.dewaele@ugent.be

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REPLY

Dear Sir:

We thank Drs. De Waele and Blot for their interest in our manuscript [1]. The major point they emphasized concerned the consideration of pancreatic necrosis as a predictive factor of severe disease in acute pancreatitis. However; this criticism actually is addressed to Balthazar *et al*., who originally described the CT severity index (CTSI) [2]. Surgeons who manage acute pancreatitis need some methods which objectively establish the presence of a disease state. CT shows the degree of inflammation and necrosis, and helps to predict patient outcome. Necrosis is a natural course of severe inflammation in pancreatic tissue, indicating the amount of tissue damage. It should not be considered solely as a complication; therefore, identification of necrosis at the initial presentation of the patient gives a clue as to the severity of the disease. In the Atlanta criteria, the presence of necrosis automatically puts the patients in the "severe disease category". CT is the method of choice for showing the presence and the degree of necrosis (non enhanced parenchyma on contrast-enhanced CT greater than 3 cm or involving more than 30% of the gland [3]). One needs to have concrete evidence of certain findings in order to direct therapy. Thus all criteria evaluating acute pancreatitis involve CT findings. We do not agree that CTSI is 'illogical' as the authors have indicated and prefer to use this criterion in the management of acute pancreatitis, and to predict the outcome of patients based on CT images.

Gunay Gürleyik[1], Gamze Kilicoglu[2]

[1]Department of Surgery and [2]Department of Radiology, Haydarpasa Numune Education and Research Hospital. Istanbul, Turkey

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Abbreviations CTSI: computed tomography severity index

Correspondence
Günay Gürleyik
Eski Bağdat cad. 29/9
Altıntepe 34840 Istanbul
Turkey
Phone: +90-216.489.8325
Fax: +90-216.373.1096
E-mail: ggurleyik@yahoo.com

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