Identification of severe acute pancreatitis using an artificial neural network.

Mofidi R, Duff MD, Madhavan KK, Garden OJ, Parks RW.

Department of Clinical and Surgical Sciences, University of Edinburgh. Edinburgh, United Kingdom.

The aim of this study was to construct and validate an artificial neural network (ANN) model to identify severe acute pancreatitis (AP) and predict fatal outcome. All patients who presented with AP from January 2000 to September 2004 were reviewed. Presentation data on admission and at 48 hours were collected. Acute Physiology and Chronic Health Evaluation (APACHE) II and Glasgow severity (GS) score were calculated. A feed-forward ANN was created and trained to predict development of severe AP and mortality from AP; 25% of the data set was withheld from training and was used to evaluate the accuracy of the ANN. Accuracy of the ANN in predicting severity of AP was compared with APACHE II and GS scores. A total of 664 patients with AP were identified of whom 181 (27.3%) fulfilled the clinical and radiologic criteria for severe pancreatitis and 42 patients died (6.3%). Median APACHE II score at 48 hours was 4 (range, 0 to 23). ANN was more accurate than APACHE II or GS scoring systems at predicting progression to a severe course (P<0.05 and P<0.001, respectively), predicting development of multiorgan dysfunction syndrome (P<0.05 and P<0.01) and at predicting death from AP (P<0.05). An ANN was able to predict progression to severe disease, development of organ failure and mortality from acute pancreatitis with considerable accuracy and outperformed other clinical risk scoring systems.
were found to be larger than 4 cm and therefore unsuitable for curative resection. Consequently, only 53% were confirmed to be suitable for resection. Of the patients explored with a view to curative resection, 42% actually underwent resection, with clearance of resection margins achieved in 77.8%. Of the patients thought to have a resectable tumor on the basis of good quality preoperative imaging, 44% had their management approach altered after laparoscopy and avoided an open procedure. Laparoscopy should therefore be used in the preoperative staging of pancreatic tumors.

**Acta Cytol 2006; 50(6):647-55.**
(PMID: 17152277)

**Fine needle aspiration of pancreatic cysts: Use of ancillary studies and difficulty in identifying surgical candidates.**

Volmar KE, Creager AJ.

Department of Pathology, University of North Carolina. Chapel Hill, North Carolina, USA.

The authors aimed to evaluate ancillary biochemical testing after pancreatic cyst fine needle aspiration (FNA) in the clinical setting. Findings from 110 pancreatic cysts evaluated by image-guided FNA were reviewed and correlated with histology, clinical follow-up and biochemical analysis of cyst fluid and serum. Adequate follow-up was available for 95. In terms of identifying cysts requiring surgery, FNA showed 55.3% sensitivity, 95% specificity, 92.9% positive predictive value (PPV) and 64.4% negative predictive value (NPV). FNA showed only nonspecific cyst contents in 51% of cases, but 40% of those patients proved to be surgical candidates at follow-up. Overall, patients with lesions requiring surgery were younger (P=0.14), more often presented with pain (P=0.006), had larger cysts (P=0.05) and less often had a history of chronic pancreatitis (P=0.12). Among cases in which FNA showed only nonspecific cyst contents, patients with lesions requiring surgery were more often female (P=0.08), were younger (P=0.10), had larger cysts (P=0.06) and had pain at presentation (P=0.02). Differences in fluid and serum analytes were not statistically significant. FNA of pancreatic cysts shows high specificity but poor sensitivity, even with cyst fluid and serum biochemical analysis. FNA of cysts requiring surgery often yielded nonspecific cyst cytology and causing a misinterpretation as pseudocysts. Ancillary biochemical analysis of cyst fluid remains problematic in the clinical setting.

**Cancer 2006; Dec 15; [Epub ahead of print].**
(PMID: 17173321)

**Cystic pancreatic endocrine tumor: a variant commonly confused with cystic adenocarcinoma.**

Deshpande V, Lauwers GY.

Department of Pathology, Cytology and Gastrointestinal Pathology Service, Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA.

Most cystic pancreatic neoplasms are currently evaluated by an endoscopic ultrasound-guided fine-needle aspiration biopsy (FNAB). In the authors' experience, FNAB of cystic pancreatic endocrine tumors (PETs) frequently causes diagnostic difficulties, partly because of unexpected overlapping features with cystic ductal adenocarcinomas. The authors identified 5 histologically confirmed cystic PETs that were evaluated by FNAB and compared their cytomorphologic features to cystic ductal adenocarcinomas. The authors identified 5 histologically confirmed cystic PETs that were evaluated by FNAB and compared their cytomorphologic features to cystic ductal adenocarcinomas (n=5) and solid PETs (n=39) of the pancreas. Cytologically, 2 of the aspirates of cystic PETs were devoid of tumor cells whereas the other 3 were variably cellular and composed of cohesive aggregates of monomorphic cellular elements with variably coarse chromatin. Tumor necrosis and nuclear membrane irregularities were not identified in cystic PETs. Alternatively, in contrast to PETs, cystic ductal adenocarcinomas were characterized by nuclear
pleomorphism, nuclear membrane irregularities, and tumor necrosis. Given the clinical implications, awareness of cystic PETs and their deceptive cytologic features would assist in distinguishing these lesions from cystic ductal adenocarcinomas.

**Homocysteine, reactive oxygen species and nitric oxide in type 2 diabetes mellitus.**


Department of Experimental Medicine, Biochemistry Section, University of Genoa. Genoa, Italy.

Type 2 diabetes mellitus shows a characteristic altered platelet function that can be due to several mechanisms such as oxidative stress. Hyperhomocysteinemia, considered as a risk factor for various arterial thrombosis, may have a role in generating oxidative damage, even if the pathogenic mechanisms are still not clear. In this report the authors aimed to determine the role of plasma homocysteine in inducing oxidative stress in type 2 diabetes mellitus. The study was performed on a group of 34 males with type 2 diabetes and 36 healthy subjects matched for sex and age. Patients and healthy subjects were undergone to laboratory evaluation for plasma homocysteine levels and other metabolic parameters. In both groups of subjects platelet reactive oxygen species, nitric oxide and guanosine 3',5' cyclic monophosphate levels were measured. Moreover the reduced glutathione content in platelets of patients and of healthy subjects was assayed. Plasma homocysteine levels were significantly increased in patients compared with healthy subjects. The basal level of reactive oxygen species was significantly higher in patients than in controls. In addition platelets of patients stimulated with thrombin produced more reactive oxygen species than healthy subjects ones. The nitric oxide, guanosine 3',5' cyclic monophosphate and reduced glutathione content were decreased in platelets of patients. As homocysteine stimulates oxidative stress and inhibits nitric oxide formation, hyperhomocysteinemia measured in type 2 diabetic patients, promoting platelet hyperactivity, could have a role in the atherogenic effects described in type 2 diabetes.

**Pancreaticoduodenectomy for suspected malignancy: have advancements in radiographic imaging improved results?**

Sasson AR, Gulizia JM, Galva A, Anderson J, Thompson J.

Department of Surgery, University Nebraska Medical Center, Nebraska Medical Center. Omaha, NE, USA.

The purpose of this study was to determine the impact of recent improvements in radiographic imaging in detecting malignant pancreatic disease. A review of 132 patients undergoing pancreaticoduodenectomy for suspected malignancy from 1998 to 2005 was performed. Since 1998, patients were evaluated with helical computed tomography and since 2002 with multidetection scanners. Seventeen patients (12.9%) had nonneoplastic disease. The majority of these patients had chronic fibrosing pancreatitis (11 patients) and sclerosing lymphoplasmacytic pancreatitis (4 patients). The incidence of benign disease in patients undergoing resection from 1998 to 2001 (n=45) was 8.9% in comparison to 14.9% for patients treated from 2002 to 2005 (n=87, P=0.39). Advances in imaging modalities made during the study period did not improve the ability to discriminate between benign inflammatory conditions and neoplastic disease. The inability to distinguish benign from neoplastic disease justifies the use of pancreaticoduodenectomy in the appropriate clinical setting.

**Thromb Res 2006; Dec 22 [Epub ahead of print].**

(PMID: 17188741)