Community, Forli, disturbances in 56% and 25% of was made. A comparison of Lactulose syrup (LS; Inakio, Italy) and Lypo-phyllized Bifidum-bacteriae (LB; Russia, 1 dose is 10^9 B. bifidum I) effects on 75 premature infants at the gestational age 32.7 ± 0.2 weeks with the disturbances in MSLI was made. The Group of 25 neonates received every day 1.0 mL of LS. The Group of 40 infants received 2.5 doses of LB 3 times a day. The course of the treatment lasted for 14 days. All the babies were fed with native breast milk.

The study of the infants included a general clinical examination; bacteriological examination of the feces. The study of the copropigment, immunoglobulin A, G, M in coprofibrates, and fecal pH of < 0.05 was considered to be significant.

After the treatment dyspeptic disorders disappeared in 90% and intestinal microflora normalized in 85% of neonates of Group 1. Normalization of above mentioned disorders after LB treatment was observed respectively only in 56% and 25% of Group 2. LS treatment led also to copropigment normalization as well as to the significant decrease in immunoglobulin A content in coprofibrates and fecal pH values. Thus utilization of LS in the treatment of the premature infants with disturbances in MSLI was more effective than that of LB.

### Helicobacter Pylori in HIV-1 Seropositive Patients

D. Vaira, M. Miglioli, A. Boschin1, M. Menegatti, J. Holton2, P. Mulè, C. Ainsley3, L. Barbara. 1. Medical Clinic, University of Bologna, Italy; 1. S. Patrignano Community, Forli, Italy; 2. Dept. of Microbiology, University College, London, UK; 3. Royal London Hospital, London, UK

Two hundred and ten dyspeptic patients, both HIV-1 +ve and HIV-1 -ve, (IMF 15/367, age range 18-52, mean 30 yrs) living in a closed city, and drug abusers were investigated for Helicobacter pylori (HP) infection by upper gastrointestinal endoscopy and serology. Control group by serology were: A) 259 asymptomatic subjects, both HIV-1 +ve and HIV-1 -ve, living in the same Community, B) 219 age and sex matched dyspeptic patients, C) 322 asymptomatic blood donors.

Results: The table shows the endoscopic findings in the endoscoped patients according to HIV and HP status (N = normal, OCV = oesophageal candidosis and/or varices, AG = antral gastritis, PU = peptic ulcer, GC = gastric cancer, ED = erosive duodenitis)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>OCV</th>
<th>AG</th>
<th>PU</th>
<th>ED</th>
<th>GC</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV+ +ve (n = 111)</td>
<td>5</td>
<td>4</td>
<td>17</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>HIV- -ve (n = 44)</td>
<td>23</td>
<td>26</td>
<td>11</td>
<td>0</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>HIV- +ve (n = 9)</td>
<td>3</td>
<td>0</td>
<td>32</td>
<td>22</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>HIV- +ve (n = 65)</td>
<td>12</td>
<td>1</td>
<td>16</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

The overall prevalence of HP infection in the endoscoped patients was 52%. Infection was more common in HIV-1 -ve (65996, 66%) than the HIV-1 +ve patients (44/111, 40%) (P < 0.001). HIV-1 +ve patients with AIDS had a lower prevalence of HP infection (24/73, 33%) compared to HIV-1 +ve patients without AIDS (20/38, 53%) (P = 0.05).

The seroprevalence rates of HP infection were similar in the dyspeptic patients (52%) and asymptomatic subjects (56%) living in S. Patrignano, and in the dyspeptic control patients not living in the Community (55%). Asymptomatic blood donors showed a lower seroprevalence of infection (33%, P < 0.001).

Conclusion: (1) HIV-1 positivity do not play a role in the development of HP infection, whereas the portal rise is probably due to life in community (2) Apart from candidiasis unusual gastroduodenal pathology is rare in HIV-1 +ve dyspeptic patients.

### Functional and Structural Changes of Small Intestine in HIV Infected Patients with Chronic Diarrhea

O. Økstendal, V. Skar, E. Dahl, A. Serck-Hanssen. Ullevaal University Hospital, Oslo, Norway

HIV infection is often associated with unexplained diarrhea and weight loss. This study was designed to see if abnormalities of the intestinal mucosal architecture could explain the enteric dysfunction found in HIV infected patients with diarrhea.

20 far coming HIV infected patients (19 men, 1 woman, CD4 0.01–0.2) with apparently non-infectious chronic diarrhea were evaluated with a new intestinal function test (D-xylene breath test) and, for fifteen of the subjects, with an upper intestinal endoscopy with biopsy specimens taken from the duodenal mucosa.

The function test showed that the D-xylene uptake was largely decreased in the same manner as for patients with celiac disease. The severe malabsorption could hardly be explained by a slight mucosal damage seen at light microscopy with partial villous atrophy and unspecific inflammation. However, electron microscopy showed enterocytes with signs of hypofunction and degeneration.

The ultrastructural changes of the mucosa appear to be the best morphological explanation to the intestinal malabsorption found in far coming HIV infected patients with chronic diarrhea.

### Serum Lipids in Patients with Acute Pancreatitis

A. Nikopoulos, E. Giannoulis, M. Karamouzis, F. Vlachostergiou, A. Theocharides, A. Tourkantonis, C. Arvanitakis. First Department of Medicine and Department of Biochemistry, University of Thessaloniki, AHEPA General Hospital, Thessaloniki, Greece

Hyperlipidaemia may be the cause of acute pancreatitis (AP) or a sequela of peripancreatic fat necrosis.

The aim of this study was the evaluation of serum lipids, i.e. cholesterol (CH), triglycerides (TG) and HDL-cholesterol (HDL-CH) in patients with AP in relation to the time course of the disease. 37 patients were studied. In 32 patients AP was due to gallstones (Group A) and hyperlipidaemia was the causative factor in 5 Group B. Methodology included biochemical tests (WBC, serum and urine amylase, serum creatinine, bilirubin, SGOT, SGPT), ultrasonography, CT scan of the abdomen, ERCP and determination of serum lipids on 1, 3 and 15, after the onset of AP Results were as follows (mean ± SD)

<table>
<thead>
<tr>
<th>Serum lipids in Group A (mg/dl)</th>
<th>CH</th>
<th>TG</th>
<th>HDL-CH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1 188 ± 45</td>
<td>112 ± 25</td>
<td>34 ± 5</td>
<td></td>
</tr>
<tr>
<td>Day 3 188 ± 47</td>
<td>118 ± 25</td>
<td>35 ± 6</td>
<td></td>
</tr>
<tr>
<td>Day 6 201 ± 51</td>
<td>126 ± 35</td>
<td>39 ± 6</td>
<td></td>
</tr>
</tbody>
</table>

No significant difference

<table>
<thead>
<tr>
<th>Serum lipids in Group B (mg/dl)</th>
<th>CH</th>
<th>TG</th>
<th>HDL-CH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1 520 ± 82</td>
<td>2091 ± 128**</td>
<td>33 ± 0.7</td>
<td></td>
</tr>
<tr>
<td>Day 3 540 ± 80</td>
<td>650 ± 212</td>
<td>33 ± 0.7</td>
<td></td>
</tr>
<tr>
<td>Day 6 215 ± 25</td>
<td>555 ± 253</td>
<td>34 ± 0.8***</td>
<td></td>
</tr>
</tbody>
</table>

NS

In summary: (1) No significant changes in serum lipids were noted in patients with AP due to gallstones during the time course of the disease (day 1, 3, 15), (2) In patients with AP due to hyperlipidaemia, a significant elevation of serum CH and TG was noted on day 1 but did not return to normal. TG levels declined significantly on day 3 and 15.

Conclusions: (1) Serum lipid fluctuate during the course of hyperlipidemic pancreatitis, but remain elevated, (2) No significant changes of serum lipids were noted in bilary pancreatitis.

### Is Biliary Lithiasis Associated with Pancreatographic Changes?


We analysed retrospectively the endoscopic retrograde cholangiopancreatographic of 165 patients presenting biliary lithiasis and of 53 controls. Among the 165 patients, 35 had gallstones, 53 had gallstones and cholecodolithiasis, 10 had cholecodolithiasis without gallstone, 50 cholecystectomized patients had cholecodolithiasis, 17 had undergone cholecystectomy without recurrence of biliary lithiasis. Analyzing the pancreatography, we measured the diameter of the pancreatic duct in the head, the body and the tail of the pancreas, the regularity of the main pancreatic duct and the presence of stenosis, the regularity or the dilatation of secondary ducts, the presence of cysts. In addition, we calculated a score based on the above parameters: pancreatographies were classified as normal or with mild, intermediate, moderate, severe abnormalities. In patients, no statistical difference for the pancreatographic features was found in case of cholecodolithiasis compared to patients without cholecodolithiasis. Patients were comparable to controls for sex, alcohol consumption but not for age (68 vs 55 years, p < 0.01). In patients and in controls, the presence of abnormalities of the pancreatography well correlated with age. The pancreatographic features of patients and controls were not found to be significantly different, even in younger controls.

Finally, multivariate analysis (stepwise multiple discriminant analysis) was performed. The age appeared as the only significant factor which was able to predict the presence of pancreatographic abnormalities.
Material and methods: The study group comprised 45 men with well confirmed alcoholic CP with the mean age of 42.9 years. The group of men chosen from general population (control group) consisted of 45 men with the mean age of 38.3 years. The dietary history was used as a tool in the research of the dietary data.

Results: Caloric value of the diet and main nutrients intake in both groups are presented in the table.

<table>
<thead>
<tr>
<th>CP group</th>
<th>control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>calorie value, kcal</td>
<td>3197</td>
</tr>
<tr>
<td>protein, g</td>
<td>120</td>
</tr>
<tr>
<td>fats, g</td>
<td>133</td>
</tr>
<tr>
<td>carbohydrates, g</td>
<td>373</td>
</tr>
</tbody>
</table>

These differences were not statistically significant. A detailed comparison revealed statistical differences only a small group of nutrients: pantothenic acid intake was higher in the study group and polysaturated fat, sodium and fiber intake was higher in the control group. The consumption of cottage cheese was twice higher in CP group but greater cheese intake was three times higher in control group. Even 72% of patients with steatorrhea consumed over 100 g of fat daily.

Conclusions: 1. The diet of the patients with alcoholic CP in the time of developed disease shows only a little differences with the diet of healthy men.
2. High mean fat intake is a factor which may be a reason of steatorrhea in many patients.

1889 KSG-504, a Novel Cholecystokinin Receptor Antagonist Prevents the CCK-8-Induced Acute Pancreatitis in Rats
L. Czakó, T. Tárcsás, F. Hajnal, J. Lonovics. First Department of Medicine, Albert Szent-Györgyi Medical University, Szeged, Hungary

The role of cholecystokinin (CCK) receptor blockade was studied in acute edematous pancreatitis evoked by high doses of CCK-8. The aim of our study was to evaluate the effects of KSG-504, a CCK receptor antagonist recently synthesized by the Kisséi Pharmaceutical Co. (Masamoto, Japan) in this pancreatitis model.

Methods. Pancreatitis was induced with serial CCK-8 injections (75 ug/kg s.c. at 2 h intervals over 6 h). KSG-504 (5 or 50 mg/kg s.c.) was injected 0.5 h before and 3 h after the last CCK administration. Rats were examined at 6 h after pancreatitis induction. To assess the severity of inflammation, pancreatic edema measurement, histological grading, serum amylase determination and plasma CCK bioassay were performed.

Results. Administration of CCK-8 alone caused edematous pancreatitis with a significant elevation of pancreatic weight/body weight (pw/bw) ratio (5.65 ± 0.7) and the serum amylase level (387 ± 4.9 U/ml) vs. the controls (3.58 ± 2.25 and 2.9 ± 0.3 U/ml, respectively). Both 5 mg/kg and 50 mg/kg of KSG-504 significantly decreased the pancreatic edema (3.45 ± 0.25 and 2.4 ± 0.2, respectively) and serum amylase activity (14.2 ± 2.3 U/ml and 5.1 ± 0.8 U/ml, respectively). The histologic changes seen in the CCK-8-treated group (interstitial edema with neutrophil cell infiltration, and pancreatic acinar cells with vacuoles of different sizes) were completely prevented by the high dose of KSG-504, but were only slightly influenced by the low dose. The plasma CCK level was significantly elevated in the CCK-8-treated group vs. the control (4.9 ± 1.4 pm and 0.5 ± 0.07 pm, respectively). No significant plasma CCK level changes were observed in the KSG-504-treated groups as compared to the controls.

Conclusion. These findings provide further evidence that the plasma CCK is involved in the pathogenesis of acute edematous pancreatitis. KSG-504 proved to be a potent CCK receptor antagonist in this acute pancreatitis model.

1870 Malignant Pancreatic Neoplasms -- Clinicopathological Correlations
K. Daiwe, P Georgiev. Military Medical Academy, Sofia, Bulgaria

The present research is based on 172 dead patient autopsies. In this study pancreatic neoplasms ranked at fourth place, after malignant neoplasms of the lung, the stomach and the colon. The men to women distribution was 80%-20%, respectively. They occurred most frequently in the 6th–7th decades – over 55%, while the 5th and the 8th decades were identically presented – 20%. The neoplastic process was mainly localized in the head of the pancreas – 71%, pure – 50%, body combined – 11%, body and tail – 10%. The predominant histological types were adenocarcinoma (75%) and anaplastic adenocarcinoma (20%). Mucus secretion was observed in 45%, anaplasia in 30%, and desmoplastic reaction – in 40%. The first metastases were found in the regional lymph nodes – 75%, the liver – 65% and the lung – 33%. Pancreatic and pleural carcinomatous were observed in 32% and 24%, respectively. As an accompaniment diseases were found: chronic pancreatitis – in 20%, peptic ulcer in 18%, diabetes – in 8% and atrophic chronic gastritis –
in 17%. The most frequently signs found were: icterus – 74%, ascites – 56% and thromboembolic diathesis – 54%. The death was connected to: lung embolism (35%), sheer cardiovascular failure (15%), liver failure (13%), liver kidney failure (12%), pentonitis and pneumonia (8%) and haemorrhage including the brain (6%). The proper ante-mortem diagnosis was made in 68% of the cases, the percentage of correct diagnoses being highest in patients with pure head of the pancreas localization and the lowest when the tumour was localized in the body tail or the tail of the pancreas.

1871 Endoscopic and Surgical Therapy of Chronic Pancreatitis
P Dití, M Ružička, V Zbořil, B. Jon. 3rd Internal/ Gastroent. Clin, Univ. Hospital, Brno-Bohunice, Czech Republic

Therapy of the particularly painful forms of chronic pancreatitis (ch.p.) is hard. Elimination of pain improves the quality of life of the patients, enables them to increase food intake and so adjust changes connected with nutritional disorder.

In 40 patients with clinically, morphologically and functionally proved ch.p. – the obstructive type ETP of the pancreatic duct was carried out and followed either by duct drainage or an attempt of stone removing from the duct. In 47 patients with chronic painful type of ch.p. and with dilatation of the pancreatic duct – resection or drainage was carried out. The subjective changes in pain, change in body weight, stool frequency and endocrine function were evaluated before and after the therapy.

Surgical and endoscopic treatment led in approximately 70% of patients to pain relief, to an increase of body weight of about more than 2 kg in 50% of patients. Drainage therapy influenced the endocrine function of the pancreas less frequently than the resection of the pancreas cauda.

Surgical therapy led to a longer duration of the favourable effect on the condition than the endoscopic one, but it was burdened with more severe complications.

Note: statistical evaluation by T-test.

1872 Assessment of the Effect of Undernutrition in Chronic Pancreatitis on Pancreatic Utilization of Amino Acids After Secretin and Cerulein Stimulation
M Jarosz, J Dzeniszewski, W Klys, H Kunachowicz. Department of Metabolic Diseases and Gastroenterology, National Food and Nutrition Institute, Poland

In undernutrition we observed disturbances of utilization of amino acids (AA) in the synthesis of pancreatic enzymes. Decreased AA level after stimulation of the pancreas was not different from that found by us in chronic pancreatitis (CP) with normal nutrition. For assessing the phenomenon of AA utilization by the pancreas after secretin and cerulein stimulation as a possible pancreatic function test it was tried to find out whether any significant difference existed in AA level decrease between patients with undernutrition in CP and those of other origin.

Material and methods. Three groups were studied: I – 13 CP patients with normal nutritional status, II – 8 CP patients with undernutrition, II – 11 undernourished patients without CP. Blood samples for AA determination (in automatic analyser) were obtained between and in the 45th minute of i.v. secretin (Sec) infusion (1 CU x kg) and cerulein (Cer) (75 ng/kg).

Results: The AA level decreased in 45 min. after i.v. Sec + Cer statistically significantly (p<0.06) in group I (by 32.4 ± 40.7 nmol/ml i.e. 10.9%) and in group III (by 316.8 ± 50.53 nmol/ml i.e. 12.5%). In group II it decreased not significantly by 94.32 ± 16.77 nmol/ml, i.e. 3.8%. This decrease (in group II) was significantly lower (p<0.001) than in group I and III.

Conclusion: After pancreatic stimulation in patients with chronic pancreatitis undernutrition the amino acids found were to be less extensively utilized for enzyme synthesis than in patients with this disease but with normal nutrition and in patients with undernutrition caused by other factors than pancreatic disease.

1873 Experience with Stenting of the Pancreatic Duct in Chronic Pancreatitis in a Central Hospital

The main goal of treatment is the relief of persistent pain or relapsing pain occurring as clinical attacks of pancreatitis. The classic treatment have been a surgical procedure. In the last 10 years a few reports have been published on the endoscopic management of chronic pancreatitis.

Material and Method: The Central Hospital of Akershus serves 400,000 peoples and are a local hospital for about 200,000.

Since January 1986, patients (n = 16), m = 12, w = 4, age 33–73 (median 55) with chronic pancreatitis with ductal strictures and/or stone and upstream dilatation underwent stenting of the main pancreatic duct through the major papilla (n = 13) or the minor papilla (n = 3) in order to drain the duct and relief of pain. The etiology was alcohol abuse in 6, gallstones in 3 and unknown in 5 patients.

Four of the patients were earlier operated on pancreas. 3 due to the chronic pancreatitis and 1 patient had underwent Whipple’s operation (1973) due to a tumor of the papilla of Vater. We have been using 5–10 French Am- sterdam” or “Pigtail” endoprosthesis. The intension was to treat the patient with endoprosthesis for 1–2 year and replace it individually in case of relapse.

Results: One severe complication did occur to the method, a purulent in- fection of the pancreatic duct. Some patients did have more pain a few days after the stent placement. All patients operated on did get a good pain relief after stenting. One of the patients with pancreas divisum had a good pain relief with the endoprosthesis. The other two underwent surgery. One do still have pain and the other died in a pancreatic carcinoma 9 months after the operation.

The rest of the patients, n = 9, is still treated with endoprosthesis and do all have pain relief in shorter or longer periods after stent replacement.

Conclusion: Chronic pancreatitis with severe pain is a difficult problem. Endoprosthesis does not solve all problems but in selected patients is the “treatment of choice”. In others it can be the way to select the right treatment.

1874 Prevalence and Incidence of Chronic Pancreatitis France. A Population Based Study
J. Faire, P. Bernades, Observatoire de la Pancréat Chirurgique. Faculté de Médecine, Dijon et Hôpital Beaunou, Clichy, France

Very few data are available on the epidemiology of chron pancreatitis (CP). Gastroenterologists, endocrinologists and radiologist from 7 french departe- ments (population 3,700,000) were asked to report from January 1990 to December 1992, all the patients seen with known or newly diagnosed CP. Prevalence and incidence rates were standardized by the direct method using the European standard population. Population used in calculating rates were based on data from the 1990 census. During these 3 years 1,293 cases were registered. Age standardized prevalence rates per 100,000 varied be- tween 0.8 and 7.8 in men according to the areas involved and between 1.4 and 4.1 in women. Incidence rates were a mean of three years regis- tration. Only cases diagnosed for the first time between 1990 and 1992 we involved in the analysis. Incidence rates varied between 10.6 and 6.1 in men and between 2.3 and 0.8 in women. Extrapolating these data to the french population it was estimated that the number of new cases each year was about 2,500 and that nearly 20,000 subjects were living with a CP. These data suggest that there are differences in prevalence and incidence rates of CP in France and that by its chronicity this illness represents an important health problem.

Supported by a grant of LTM-Latéma, France (Solay Pharma).

1875 Management of Multiple Abscesses Following Necrotizing Pancreatitis

Pancreatic abscess and sepsis are the leading causes of mortality in necrotiz- ing pancreatitis. Since 1986, 123 patients with infected pancreatic necrosis and several retroperitoneal abscesses have been treated. In all cases, the in- fected necrosis or pancreatic abscess was combined with retroperitoneal ab- scesses. 80 were situated the right or left retroperitoneal, 13 in the subperitoneal region, and 30 in the retroperitoneal area. The surgical treatment was performed on average 18.5 days after the onset of acute pancreatitis. The operative management consisted of wide-ranging necrosectomy in the total affected area, combined with widespread washing and suction drainage. In 56 of the 123 cases (45.9%), some other surgical intervention (distal pancre- atic resection, splenectomy, cholecystectomy, or colon resection) was also performed. Continuous washing and suction drainage was applied for an av- erage of 39.5 days, using 6 2 liters of saline solution per day. The bacte- riologic findings revealed mainly enteric bacteria, but Candida infection was detected frequently. The incidence of fungal infection was 21%. Dissemi- nated Candida infection was noted in 12 cases and 3 of these died. Recently capacity of cytokine production (TNF, IL-1, IL-6) has been investigated and it has shown correlation with the prognosis. The overall hospital mortality was 7.3% (9 patients died). In our experience, the procedure of choice for pancre- atic abscesses is aggressive surgical treatment, continuous, long-standing washing and suction drainage, together with supportive therapy combined with adequate antibiotic and antifungal medication. This surgical strategy is the only possibility for recovery in cases of pancreatic abscesses.

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1876 Operative Treatment of Chronic Pancreatitis in a Central Hospital
A.E. Færden, A.R. Rosseland, B. Edwin. Surgical Department, section of gastroenterology, Central Hospital of Akerhus, 1474 Nordbyhagen, Norway
The Central Hospital of Akerhus serves 400 000 people and is a local hospital for about 200 000.

Materials and Methods: From May 1983 to May 1993, 56 patients have been hospitalized due to chronic pancreatitis. Different operations have been performed in 17 patients, 9 men and 8 women, median age 48 years (33-68).

The indication was severe pain in all, but 2 had jaundice as well. The etiology was alcohol abuse in 9 patients, gallstone in 1 and unknown in 4. 3 patients had pancreatic carcinoma, in 2 the diagnosis were verified at autopsy, and in 1 at re-operation because of increasing pain.

The operations used where internal stomes because of pseudocysts in 4, resections of the tail and body of pancreas in 3, pancreaticojejunostomy in 2 and Whipple’s operation in 2 patients. There were 2 severe post-operative complications; both external pancreatic fistula. One had to be re-operated, the other was treated with an endoprosthesis in the pancreatic duct.

Results: The outcome was good or excellent in 8, in 5 patients the pain relief was good for only a period of 6 to 4 years. 2 of these patients have later been treated with endoscopic endoprosthesis in the pancreatic duct. 1 of our patients had no benefit from the operation.

Conclusion: Chronic pancreatitis with severe pain is a difficult problem. It may also be difficult to differentiate between pancreatic carcinoma and chronic pancreatitis. In 3 of our patients we missed this diagnosis. 13 out of 17 patients had benefit from the operation.

1877 Synthetic Proteinase Inhibitors Exert Oxidative Stress Ameliorating Effect in Acute Experimental Pancreatitis
A. Dabrowski, A. Gabryelewicz. Gastroenterology Dept., University Medical School, Białystok, Poland
This study was undertaken to determine whether synthetic proteinase inhibitors – nafamostat mesilate (FUT-175) and gabexate mesilate (FOY) have any influence on multienzyme antioxidant-antioxidant balance in acute experimental pancreatic disease. Acute hemorrhagic pancreatitis was induced in male Wistar rats using a retrograde intraductal injection of 5% Na-taurocholate. Rats were treated with FUT-175* (25 mg/kg/h) or FOY* (2.5 mg/kg/h) given i.v. immediately after pancreatitis induction. Animals were sacrificed at 3 h; malondialdehyde (MDA) concentration, as an index of oxidative injury, and sulphhydril groups (SH-groups), known as a major nonenzymatic antioxidant, were determined in pancreatic, lung and liver tissue. Results are expressed as mean ± SD.

Similar results were obtained in liver tissue.

In conclusion, our study demonstrates that treatment with FUT-175 or FOY has a multigenic oxidative stress ameliorating effect in Na-taurocholate-induced acute pancreatitis in rats. At least in part, it may account for recently postulated favorable systemic effects of such a treatment in men.

* Kindly provided by Torii Co., Japan and to ONO Pharmaceutical Co. Ltd, Japan.

1878 Effect of Octreotide on the Pain of Chronic Pancreatitis
Pain relief is a primary objective in the treatment of chronic pancreatitis (CP), but one that is often difficult to achieve, probably due to its etiologic complexity. The aim of this work was to assess the effect of octreotide, a potent inhibitor of exocrine pancreatic secretion, on the pain of CP. Twenty-one patients with CP (20 m, 1 f; mean age 49 yrs, range 30-70), alcoholic in 19, idiopathic in 2, were studied. The main criterion for inclusion was persistent pain requiring daily analgesic treatment for at least one week. Fourteen patients had a pseudocyst, with diameters ranging from 5-14 cm. Octreotide was administered subcutaneously at a dose of 0.1 mg i.d. for one week. Before and during the study, patients were monitored clinically and by abdominal ultrasound. Daily diaries were kept recording pain intensity and analgesic use. In 13 of the 21 patients studied, the octreotide had no significant effect on the pain, nor on the use of analgesics. These 13 comprised the 7 patients without cysts and 6 of the 14 with cysts. In these latter 6 patients, the size of the pseudocyst remained unchanged during octreotide treatment. In the remaining 8 patients pain disappeared completely after 2-5 days of treatment.

1879 Circulatory and Metabolic Effects of PACAP in the Pancreas
Pituitary adenylate cyclase activating polypeptide (PACAP) is a new member of secretin-glucagon peptides family that has been recently discovered, it is a potent polypeptide that can act on the vasculature. We investigated the effects of PACAP on pancreatic blood flow and oxygen consumption. In anesthetized dogs, the superior pancreaticoduodenal artery blood flow (SPBF) was measured by ultrasonic blood flowmeter (Transonic System T206), pancreatic microcirculatory blood flow (PBF) was determined by laser Doppler flowmetry (Laser Flo 403A). Pancreatic oxygen consumption (PVO2) was calculated as the product of the arteriovenous oxygen difference (AVO2) across the pancreatic circulation and SPBF. PACAP-38 (0.5-2.0 g/kg) injected into the superior pancreaticoduodenal artery caused a significant (within 30-40%) and dose dependent increase in the SPBF reaching about 60%, 80% and 90% of the control value (44.3 ± 6.2 ml/min) and in PVO2 reaching 35%, 48% and 56% of the control value (2.24 ± 0.12 ml/min). PBF was also dose-dependently increased reaching peaks of 70%, 90% and 110% of the control value (3.5 ± 0.5 V). Systemic arterial pressure was not influenced by i.a. injection of PACAP in doses used. These results indicate that PACAP causes relaxation of arteriolar and precapillary sphincters thereby inducing pancreatic hyperemia and increased oxygen consumption. These vascular and metabolic effects of PACAP in the pancreas at least in part might be due to the increased secretory activity with enhanced metabolic demand of the gland for oxygen.

1880 Dose- and Time-Dependent Effect of Alcohol and Acetaldehyde Exposition on the Amylase Secretion of Isolated Rat Pancreatic Acini Stimulated by Cholecystokinin Octapeptide (CCK 8)
F. Hajnal, L. Czako, S. Csáti, J. Lonovics. First Department of Medicine, Albert Szent-Györgyi Medical University, Szeged, Hungary
We have previously shown that intragastrically given alcohol has a non-competitive inhibitory effect on the amylase secretion of the isolated pancreatic acini stimulated by cholecystokinin octapeptide (CCK 8).

Methods: Isolated acini were prepared from male Wistar rats by a method as described by Hajnal et al., Gastroenterol. 1990; 98: 191. The acini were incubated with different doses of alcohol and acetaldehyde for 30-240 minutes. The acini were then stimulated by raising doses of CCK B and the amylase secretions were measured.

Results: Preincubation with 10, 20, 50, and 100 mM alcohol caused a significant increase in the threshold dose of CCK B and a graded decrease in the amylase secretion at the higher secretagogue doses. Raising of preincubation time caused a proportional non-competitive inhibition of amylase release. After preincubation with 10 mM acetaldehyde also a non-competitive...
inhibitory effect was observed in the amylose secretion stimulated by CCK 8.

Conclusion: The time- and dose-dependency of the alcohol and acetatl-hyde exposition of the acini may refer to the progressive intoxication which is reflected by the declining enzyme production. The identical effects of al-

cohol and its toxic metabolite may serve as indirect evidence for the alcohol metabolizing feature of the acinar cell.

[1881] Acute Pancreatitis in Buskerud County-Incidence and Etiology
F.A. Halvorsen, S. Ritland. Department of Medicine, Buskerud Central Hospital, Drammen, Norway
The incidence of acute pancreatitis is not well established, but figures of 10-

20/100,000 have usually been found in studies from Great Britain and USA, while the diagnosis has been made more frequently in urban Swedish populations. We wanted to study the incidence of acute pancreatitis in a norwegian population, covering both rural and urban areas – the county of Buskerud with 224,000 inhabitants.

All three hospitals in the county participated. All patients presenting with sympotoms consistent with acute pancreatitis and serum-amylase or serum-

lipase values of more than twice the upper reference limit, i.e. 600 UI and 400 UI, respectively, were prospectively included.

Hyperm ipsum was seen in 139 cases, giving an incidence of 61/100

000. Acute pancreatitis was diagnosed in 123 instances (in 119 patients, 68 men and 51 women), the incidence being 54.7/100 000. The mean age was 60.8 years (range 21-92 years). The etiology was gallstone disease, alcohol abuse and drugs (usually NSAIDS) in 45, 17 and 7%, respectively, while 8% of the cases were classified as idiopathic. Cholecystectomy and papillotomy had been performed earlier in 11% and 4% of the patients, while these proce-

dures were done in 11% and 31%, respectively, during the hospital stay. A comparison between the patients with alcoholic and gallstone induced pan-

creatitis showed the former to be mostly men, younger, staying shorter time in hospital and with lower median values of serum amylase, bilirubin and amiontransferases. Seventeen patients (14%) had a history of recurrent pan-

creatitis, the cause being alcohol abuse and gallstone disease in 7 and 3, re-

spectively. Pseudocysts or abscesses were seen in 9 patients (7.3%), while 7 patients (5.7%), 6 of them men, died. Their mean age was 79 years.

The incidence of acute pancreatitis in Buskerud county in southern Nor-

way is apparently higher than in British and American populations, but lower than the figures from some Swedish studies. Regarding etiologies, sex- and age distribution and complications our results are comparable to earlier stud-

ies.

[1882] Study of 136 Main Pancreatic Duct Retrorgeo Catheterisation Over 70 Years of Age
P. Hastier, H. Kuhdorf, A. Harris, E. Sgro, J.P. Arpurt, R. Dumas, F.X. Caroli-Bosc, D. Bianchi, J. Delmont. Dept. Hepato-Gastroenterology, Hospital de Cimiez, 06000 Nice, France
The authors evaluated during a 6 year period all E.R.C.P performed in patients over 70 years of age.

The aim of this study was to determine the morphological abnormalities of the pancreatic ductular system in elderly patients. 136 E.R.C.P were thus as-

sessed. 31 cases showed an abnormality related to organic disease (22.8%): 13 pancreatic cancers (41.9%), 10 chronic calcifying pancreatitis (32.2%), 4 vaterians ampullomas (12.9%), 3 pancreas divisum (9.7%)and one case of odisies following biliary lithiasis (3.3%). The 105 remaining E.R.C.P showed a normal or dilated wirsung duct as follows: wirsung duct normal in 31.4% of patients – partially dilated in 23.5% (cachepical dilatation in 64% and cephalo-
corporeal dilatation in 36% of patients). The wirsung duct was globally dilated in 44.8% of cases (1.6% of which were markedly dilated; in these cases, we have coined them as "megawirsung" of the elderly). The collateral ducts were dilated in 26.7% of cases and cysts were found in 14.2%. In conclusion this study shows that there are two types of wirsung duct in the elderly: (1) 20% of wirsung ducts are morphologically normal. (2) 80% of wirsung ducts are dilated, 22.8% of which can be ascribed to oncologic causes and 57.2% with out any cause. The authors discuss the mechanisms of main pancreatic duct dilatation.

[1883] Prospective Echoendoscopy Study of the Prevalence of Early Chronic Pancreatitis in 47 Non Cirrhotic Alcoholic Patients
Echoendoscopy (EES) is increasingly used in the assessment of pancreatic disorders. EES has been proposed as a valid screening test for early stages of chronic pancreatitis (ECP). The most commonly encountered signs are: the areolar aspect of the pancreatic parenchyma and the dilatation of the main pancreatic duct (MPD). The aim of our study was to determine the prevalence of these echodenscopic signs.

Materials and methods: From nov 92 to aug 93, 47 alcoholic patients (>80 g alcohol/day >5 years)(42 men, 5 women)(group I), mean age 44.7 years, were hospitalized for withdrawal and clinical assessment. 23 non alcoholic patients (<20 g alcohol/day for more than 5 years)(group II). All patients under

went EES under neuroleptanalgesia with a 3M Olympus endoscope. Mean alcohol consumption was 273.7 g/day in group I and 13.6 g/day in group II. Liver biopsy was performed in 42 patients (88%) and showed acute al-

coholic hepatitis in 8 patients and fibrosteatosis without cirrhosis in 34 patients.

Results: (1) Group I: EES was normal in 26 patients (55.3%) and estab-
lished the diagnosis of ECP in 21 patients (44.7%) based on the following find-

ings: (a) parenchymal changes: areolar pattern in 18 cases; hyperechogenic spots in 6 cases; microcyst in 1 case. (b) ductal changes: increased diameter of the MPD in 6 cases, hyperechogenic limits in 6 cases, distorted MPD in 4 cases. The MPD was normal in 7 cases. (2) Group II: EES was normal.

Conclusion: The prevalence of ECP in non cirrhotic chronic alcoholic pa-

tients is 44.7%. This high prevalence should encourage the use of EES as a routine exam in the management of alcoholic patients undergoing with-
drawal. Combined with clinical follow-up, EES may also become part of the monitoring of disease progression in order to detect chronic calcifying pan-

creatitis in case of persistent alcoholic addiction.
1888 Prognosis of Pancreas Cancer Course by Tumor Markers Method
A.V. Kalinin, S.V. Skvortsov, B.N. Lytsar, E.A. Antokhin. The Main Military Hospital, Moscow, Russia

Purpose of study: to find out if it is possible to prognosticate the course of pancreas cancer (PS) depending on the level of tumor markers (TM) SA-19-9 and carcinoembryonic antigen (CEA) in blood serum.

Method of study: SA-19-9 and CEA count in blood serum of PS patients was determined by enzyme immunoassay using sets produced by DIAplus, a Swiss-Russian joint venture company.

Results: the table below shows correlation between TM concentration in blood and length of survival of PC patients.

<table>
<thead>
<tr>
<th>Survival after TM test was made</th>
<th>Normal TM in blood</th>
<th>Increased TM count in blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA-19-9</td>
<td>CEA</td>
<td></td>
</tr>
<tr>
<td>moderate</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>&lt; 3 months</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>n = 22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-6 months</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>n = 9</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6-12 months</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>n = 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 1 year</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>n = 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: increased TM count in blood: moderate – not more than by 2-3 times, high – over 10 times.

A distinct correlation was found out between the length of survival of PS patients and higher than normal TM count as well as TM level in blood at the moment of initial test. All 22 patients who died within 3 months had increased SA-19-9 and CEA count in their blood, with 15 (68.2%) of them having one time excess of normal content; 5 more (22.7%) had a considerable increase of SA-19-9 and CEA in their blood as against the normal.

At the same time no one patient of the 4 who lived longer than a year showed a considerable increase of TM and simultaneous pathological count of SA-19-9 and CEA, and one case showed their normal level.

Conclusion: the length of survival of a PC patient depends directly on the level of SA-19-9 and CEA in blood at the initial testing. At the same time excess of SA-19-9 and CEA in blood against the norm is a poor prognosis for the length of survival of a PC patient.

1887 Are There Simple Markers for the Prompt Diagnosis of Cholelithiasis in Patients with Acute Pancreatitis
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The purpose of this study was to investigate possible diagnostic markers for the prompt diagnosis of coexistent cholelithiasis in patients with acute pancreatitis.

Subjects/methods: 68 patients with acute pancreatitis, aged 45 ± 12 years were retrospectively distributed in two groups. The group I was consisted of 32 patients and the group II of 36 pts according to the coexistence or not of cholelithiasis respectively. Serum alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (SAP) and bilirubin (Bil) levels were evaluated and a multivariant logistic regression analysis was performed between the two groups.

Results: Statistically significant differences (p < 0.01), were noted in female patients, and ALT, AST, SAP, Bil values in group I patients as compared with group II patients. The following laboratory results (cut off), received on admission were of value in predicting whether a pancreatitis attack was associated with gallstones or not: ALT > 55 UL (n.v. = 10-42), SAP > 140 UL (n.v.: 40-120) Bil > 1.3 mg/dl (n.v.: 0.5-1.1).

It was estimated by regression analysis that the presence of more than 3 criteria predicted coexistant gallstones, while the absence of all five markers excluded this association.

1889 Clinical Value of Dolichol Measurement in Pancreatic Cancer Control
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Pancreas contains a highest level of Dolichol (Dol) concentration in human tissues. Dol is responsible for the state of cell membranes and synthesis of N-glycoproteins in Dolichyl Phosphate Cycle (DPC). Urinary Dol have been reported to be 5 to 40 times the normal values, suggesting a metabolic abnormality of DPC in patients with cancer (Pullarkat et al., 1984). With focus on a tumor marker, the present study was carried out to estimate blood and urinary levels of Dol in patients with pancreatic cancer (PCA) and chronic pancreatitis (CHP).

The samples obtained from 29 patients with PCA (male, 38-67 years old) and 48 patients with CHP (male, 40-58 years old). Dol in blood and urine was assayed by HPLC method (Turpinen, 1986). Dol in healthy men’s blood and urine are 124 ± 8.5 ng/mL and 5.9 ± 0.6 μg/mol creatinine respectively. CHP Dol content in urine was much the same, but Dol content in blood showed an increase of 45-82%. Blood Dol concentration in patients with PCA increased at stage I to 5%, at stage III up to 55%, making up 204.2 ± 12.9 ng/mL at stage IV. There was a significant difference between urinary Dol content in patients with CHP and that of cancer patients. Urinary Dol concentration increased at stage I up to 19-38%, making up 12.8 ± 2.8 μg/mL at stage II. At stage III the level of urinary Dol was 3-5-fold increased.

These findings suggest that Dol appeared in urinary excretion is one of the first manifestations of malignancy in pancreas. In this way CHP therapy should be carried out under Dol excretion control. The interest drawn to the employment of Dol as marker is explained by the fact that known PCA markers are glycoproteins (CA-50 and CA-19-9). There is reason to suggest that markers detected in PCA may evidence the presence of the primary DPC related. Monitoring CHP patients with monthly urinary Dol determinations is a reliable method to diagnose a PCA.

1890 Clinical Peculiarities of Alcoholic Pancreatitis
A.S. Loginov, V.M. Sadokov. Central Research Institute of Gastroenterology, Moscow, Russia

Examination of clinical peculiarities of alcoholic pancreatitis (API) is the aim of this study. 170 patients with AP (167 male, 3 female, age 25-62 years) were observed for the period 2-12 years by special program.

The first clinical symptoms of pancreatitis appeared after 15 years of alcoholic abuse. The middle age of patients by the appearing of the first symptoms was 36 years. Dull pain in the upper part of abdomen preceded the first attack in 76% of these patients. We called this period as the stage of the early clinical symptoms. 93% of patients had the relapse stage, which began with the first attack. Duration of this stage depended on the development of complications and the degree of loss of the functional tissue in pancreas. Complications of AP appeared in 38% of patients. The complication stage may appear immediately after the first attack or a number of relapses may precede it during a few years. Exocrine pancreatic insufficiency was observed in 87% patients with AP its clinical signs were detected only in 12% patients on the late stages of the diseases. 21% of patients had diabetes mellitus.

The study of natural history of AP discovered that its multimodal clinical course was due to the different stages of the disease. The stages of early clinical symptoms, relapses, complications and severe functional insufficiency of pancreas were the most distinct. The clinical stages reflect the severity of morphological disturbances in pancreas.
**1891** Success and Pitfalls in Ultrasound- and Endoscope-Guided Internal Drainage of Pancreatic Pseudocysts

L. Mădi-Szabó, I. Farkas, J. Pásztor. Dept. of Gastroenterology, Budavárgyöngy, Főr Ferenc Hospitals, Budapest, Kerepestorcasz, Hungary

Purpose of the Study: Percutaneous ultrasound- and endoscope-guided internal drainage is a rather simple and fast method to cease pancreatic pseudocysts lying near the stomach. We performed this intervention in 72 cases, successfully in 65 ones.

**Patients and Methods:** Fifty-nine Men and six women had been treated in this way in six years. All except for two suffered from alcoholic pancreatitis. There were pseudocysts treated with a diameter only of 3 cm or larger due to technical reasons. The intervention was followed by regular check-ups and the catheter was endoscopically removed after one year.

<table>
<thead>
<tr>
<th>Benign cysts</th>
<th>Malignancies</th>
<th>Recovery</th>
<th>Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>3</td>
<td>48 (77.5%)</td>
<td>14 (22.5%)</td>
</tr>
</tbody>
</table>

**Results:** The attempt to insert the catheter was unsuccessful in 7 cases (5 wrong guidances, 1 leakage, 1 vagotomy) malignancy in 3 cases (diagnosed 1-60 days after intervention) successful in 48 cases (77.5% of the treated 62 benign cysts) complicated in 14 cases (6 level: 8 abcess forming, 2 less). The amylase activities of the absorbing cysts were under 10.000 IU.

**Conclusions:** In spite of the numerous benefits this method has some considerable drawbacks. Some of them are thought to be developing on physiological grounds (abscending of cysts with low enzyme content), others may be caused by the insufficiencies of the device (usor, poor diagnostics of malignancies). Thus an improvement of the method and catheter seems to be necessary.

**1892** Expectant Management of Acute Biliary Pancreatitis (ABP); A Prospective Clinical Trial

K.J. Manolos, K. Romanidis, G. Minopoulos, N. Lyrazopolous, P. Psatha, P. Skaphida. Dept. of Surgery & ICU, Demokriton University of Thrace Medical School, University & Regional Gen. Hospital Alexandroupolis, Greece, Hellas

The optimum management of ABP still remains a matter of debate. Surgery during the attack is followed by unacceptable high morbidity/mortality rates. Conservative management including endoscopic sphincterotomy for impacted stone removal is gaining widening popularity but only few studies have been published, mainly showing the immediate effectiveness of sphericterotomy, a procedure which could be avoided as being either unnecessary or harmful in certain cases.

In this prospective clinical trial, 39 noncausative cases (19 males, m.a. 62 yrs & 20 females, m.a. 51 yrs) of ABP were submitted within the first 48 hrs from the onset of the attack to a strict conservative therapeutic regimen including: n.p.o., nasogastric drainage, TPN, broad spectrum antibiotics IV gastric antisecretory medication and anticoagulants. On admission all patients had upper abdominal US and CT scans, full liver-pancreas-kidney and blood tests and close monitoring thereafter of their respiratory, renal, hepatic, pancreatic and cardiac/circulatory functions. Upper abdominal US and CT scans were repeated on the 7th day. The general condition and the seriousness of the attack were estimated independently both on admission and on the 7th day using the APACHE II scoring system and the Ranson's scale respectively. All patients but one (38/39-97.5%) had a full clinical and biochemical recovery by the 7th, on average, day. It was found that: (a) although the seriousness of the attack is in accordance with the CT findings, it does not necessarily correspond with the general condition, (b) plasma and urine amylase levels dropped to normal by the 4th, on average, day, (c) in 38/39 patients (97.5%) there was neither respiratory nor renal function impairment, (d) in 10/39 patients (25%) the impaired liver function was normalized by the 7th day and (e) the overall morbidity rate was 15% and the mortality rate 2.5% (1/39 patients died of MOF). All patients underwent cholecystectomy (in 8/39-21% the CBD had to be opened-searched for stone removal) 4-6 weeks after the attack had fully subsided.

The overall data in this series strongly suggest that the early start of conservatve treatment in ABP can result in biological reverse, prevent further pathological pancreatic changes, diminish respiratory and renal complications and finally improve the overall outcome figures.

**1893** Role of Pancreatic Duct Pressure in the Outburst of Severe Acute Pancreatitis (AP)


The search for a possible relevance of intraductal pancreatic pressure in the development of AP aimed this study. In mongrel dogs, kept under pentobarbital anesthesia, common bile duct (CBD) and main pancreatic duct (MPD) were cannulated with catheters connected to a transducer. After 20 min base-line pressure measurement, saline was infused into the CBD and MPD (flow rate: 0.5 ml/min and 0.2 ml/min), to reach a constant perfusion pressure. After stopping the perfusion, the slope time (ST) to reach a plateau pressure (PP) was checked in controls and 6, 12, 24, 48 and 72 hr following the onset of AP induced by a trypsin/enterokinase mixture infused at doses as to trigger either a necrotizing (N) or an edematous (E) form. As compared to controls, in NAP pancreatic PP was significantly higher throughout the study and peaked at 24 hr (cmH2O: 118.3 ± 43.5 vs 44.1 ± 7.3, p < 0.01) and ST extended (sec: 67.5 ± 27.1 vs 17.6 ± 6.4, p < 0.01). The same applied to CBD: PP 18.6 ± 4.1 vs 10.1 ± 1.2, ST 12.6 ± 2.2 vs 7.7 ± 1.6, p < 0.05. Conversely, no change of these parameters was observed in EAP (Unlike EAP all NAP showed severe papillary and peripapillary inflammation). A milder histological score was observed in a separate NAP group treated by MPD drainage. These results suggest that in AP, the most severe damage is linked to an increased MPD pressure which is causally triggered by a papillary inflammation.

**1894** Nafamostat Mesilate (FUT) Enhances Functional Recovery After Partial Pancreatectomy

F. Marotta, P. Safran 1, L. Snider, O. Bellini, K. Suzuki 2, G. Barbi. GI Service, "S. Anna" Hosp., Como, Italy; 1 Ecomum, Villeneuve d'Ascq, France; 2 Toini & Co., Tokyo, Japan

Male Wistar rats underwent either 70% or 90% pancreactomy (Px). Twenty sham-operated rats served as control. Each group (45 rats) was then allocated into 1-month inaproteineral treatments: (1) saline 2 ml; (2) FUT 25 mg/kg. At 3, 7, 15, 21, 30 and 60 days after surgery endocrine and exocrine pancreatic functions was assessed by IV glucose (0.5 g/kg) tolerance test (GTT) and BT-PABA test, respectively. Each time 5 rats in each group were sacrificed for tissue regeneration study and biochemical assays. Starting from 7-day observation, in both groups FUT determined a significant increase of protein and DNA synthesis and content (p < 0.05) as compared to saline group. An abnormal GTT was observed in 70% Px group, irrespective of the treatment with reversal to normal at 21-day. Whereas no normalization was observed after 90% Px. A statistically significant increase (p < 0.01) of insulin and glucagon content was observed in the remnant pancreas throughout the study, unaffected by treatment. FUT treatment significantly increased (p < 0.05) amylase activity in both Px groups. Urinary PABA excretion was markedly impaired (p < 0.01) after surgery. Unlike 90% Px group, in 70% a normalization was observed at 60-day after saline treatment. However, FUT treatment caused an earlier normalization in 70% Px group (p < 0.05) and at 60-day in 90% Px group.

These data show that the FUT-induced hypotrophy and hyperplasia of the remnant pancreas is paralleled by a significant recovery of the exocrine function.

**1895** Splanchnic Hemodynamics During Acute Pancreatitis: A Basic Experimental Study


The aim of this study was to evaluate the regional blood flow during acute pancreatitis (AP). Through a laparotomy, ultrasonic probes were placed on gastro-duodenal artery (GDA), superior pancreatic-duodenal vein (SPDV), common hepatic artery (CHA) and portal vein (PV) in dogs. A week later, AP was induced by trypsin/enterokinase intraductal injection while giving a 24 hr Ringer infusion (Group 1) or not (Group 2). Unlike Group 1, Group 2 showed an overall derangement of cardiac performances. After 3 h and afterwards, GDA flow (corrected to cardiac function) significantly dropped in Group 2 but not in Group 1 (p < 0.05). However, in both groups a sudden fall of SPDV flow occurred (p < 0.05). From 9 h onwards, total hepatic (TH) flow in Group 2 significantly decreased (>40%, p < 0.05), due to a deranged PV (>60%, p < 0.01) but not CHA flow. However, corrected TH flow showed an overall trend increase. In Group 1, starting from 3 hr observation, CHA flow increased (>30%, p < 0.01) with an overall blood flow rise (>40%).

These results suggest that in the course of AP regional blood flow changes are only partially dependent by cardiac output. Further, adequate rehydration cannot prevent the severe pancreatic outflow derangement which takes place at a very early stage.
1896 Ultrasonographic Abnormalities of the Pancreas in Insulin Dependent Diabetes Mellitus (IDDM) Patients

M.R. Mas, Ü. Ateşkan, A. Dinç, Z. Beyhan, K. Sağlam, Y. Baykal, S. Eriği, A.K. Gürbüz, F. Kocabalkan. Dept of Internal Medicine, Gülhane Military Medical Academy and Medical School, Ankara, Turkey; Endocrinology, Gülhane Military Medical Academy and Medical School, Ankara, Turkey.

We evaluated the pancreatic structure and the size in IDDM patients. A real time array system (3.5 mHz electronic transducer) was used for ultrasonographic measurements of the maximum diameters of the head, body and tail of the pancreas. The pancreatic head was measured anterior to inferior vena cava and the body of the pancreas anterior to the superior mesenteric artery, whereas the tail was measured from its beginning near the left lateral border of the lumbar vertebral body. In this study, 25 IDDM patients (23 male, 2 female) and 27 healthy control subjects (25 male, 2 female) were studied.

The diameters measured are shown in table.

<table>
<thead>
<tr>
<th></th>
<th>Pancreas (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>Body</td>
</tr>
<tr>
<td>IDDM patients</td>
<td>20.16 ± 0.78</td>
</tr>
<tr>
<td>Control subjects</td>
<td>24.13 ± 0.12</td>
</tr>
<tr>
<td>t Value</td>
<td>5.196</td>
</tr>
<tr>
<td>p Value</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

These results were not related to differences in age, sex or body size. Pancreatic image was predominantly hypoechoic in 81% of IDDM patients. At the end of our study, we observed that in IDDM patients, pancreatic diameters were smaller than control subjects, probably due to acinar atrophy and fibrosis.

1897 Acute and Chronic Pancreatitis Induced by Trinitrobenzene Sulfonic Acid (TNB)

X. Molero, V Puig, A Salas, L. Guimer, J.R. Malagalda. Digestive System Research Unit, Hospital General Vall d’Hebron, Barcelona; 1 Pathology Dept, Hospital Mutua, Terrassa, Spain

Animal models of chronic inflammatory lesions of the pancreas are scarce. TNB has been successfully employed to induce chronic colitis and cholangitis by direct infusion into the appropriate luminal segment. The mechanism of TNB chronic inflammation involves an immunological reaction to the hapten TNB-protein complex. We hypothesized that TNB instillation into the pancreatic ducts would also induce inflammatory lesions and ultimately produce a viable model of chronic pancreatic disease. Male-S-D rats (300-350 gr) were ketamine anesthetized and the pancreatic duct cannulated through its duodenal opening. The duct was tied close to the liver and 0.4 ml of TNB 2% in PBS-10% ethanol (pH 8) was infused into the pancreas with the aid of a volumetric pump connected to a pressure transducer. Intrapancreatic pressure was never allowed to exceed 5 mmHg over basal. Control rats underwent the same procedure, but TNB was absent in the buffer. When infusion was completed, ligatures were released and bilio-pancreatic secretion allowed to drain for 30 min. The cannula was then withdrawn and the duodenum and abdominal wall sutured. Evaluations were performed in the acute and in the chronic phase. For the acute phase rats were killed at 48 h. Serum amylase rose to 22.2 ± 1.9 U/ml at 24 h and to 72 ± 4.8 h, well above control levels of 5.1 ± 0.1, p < 0.05 for both time points. Pathology assessment was consistent with severe necrohemorrhagic pancreatitis with prominent intra- and peripancreatic stenoncrosis. Spontaneous mortality rate during the acute phase was 50% (12 out of 24 rats). For the chronic phase rats were studied up to four weeks. At that end point serum amylase had returned to normal (4.7 ± 0.5) and pathology disclosed chronic changes in 43% of the surviving rats, consisting in various degrees of periductal fibrosis, patchy acute and chronic inflammatory infiltrates, common duct stenosis and signs of segmentary gland atrophy. Thus, TNB induces acute necrotizing pancreatitis that may progress towards development of chronic pancreatic disease, with features mimicking the human disease.

1898 Study of Pancreatic Lesions in Liver Cirrhosis and Hepatocellular Carcinoma – Examination of Pathological Specimens

T. Nakajima, H. Ohkune, H. Yoshioka, M. Nakajima, S. Yabe, K. Fujimura. Third Department of Internal Medicine, Saitama Medical School, Japan

We examined pancreatic lesions in autopsy of patients with hepatic failure caused by liver diseases. Subjects were 109 autopsies (25 patients with liver cirrhosis [LC] and 84 with hepatocellular carcinoma [HCC]). The average age of patients with LC and HCC was 55.7 ± 6.3 and 57.4 ± 7.1 years, respectively. The male-to-female ratio in the LC group was 6:19, while the ratio in the HCC was 16:68.

In LC, 10 with hepatic failure and 2 without it had pancreatic lesions; in HCC, pancreatic lesions were exhibited in 44 with hepatic failure and 5 without it. In both groups, patients with hepatic failure had frequent complications, and HCC group showed the higher frequency. There was no difference in the size of tumor and effects of treatment in HCC group. On the other hand, in patients with tumor embolus in the portal vein, pancreatic lesions were recognized very frequently (95%). Pancreatic lesions appeared more frequently with complications of portal hypertension and disseminated intravascular coagulation (DIC) than without complications. Details of pancreatic lesions: fat necrosis and hemorrhage were recognized more frequently in HCC than LC, and hemorrhage was often shown with complications of DIC. Complications of pancreatitis was recognized with portal hypertension or complications of DIC, and LC. Among patients with HCC, pancreatic lesions were often recognized with tumor embolus in the portal vein.

Therefore, it is suggested that the change in portal circulation is a factor causing pancreatic lesions as well as change in the coagulating fibrinolysis system.

1899 Does Serum Amylase Determination Give More Information Over the Diagnosis in Patients with Acute Biliary Pancreatitis (ABP)?

A. Nowak, T. Marek, E. Nowakowska-Dulawa. Department of Gastroenterology, Silesian University School of Medicine, Katowice, Poland

Background: Although serum amylase determination is the main diagnostic examination in acute pancreatitis (AP), the data concerning its usefulness in the prognosis of AP are inconsistent.

Material and methods: The diagnosis of AP was based on clinical picture, serum amylase levels (normal: <200 U) and positive pattern of pancreatitis in US and CT-scan.

280 patients with ABP underwent urgent (<24 h) duodenoscopy. Patients with stone impacted in the papilla of Vater were treated by endoscopic sphincterotomy (ES); (group I). Patients with normal papilla were treated by ES (group II) or managed conventionally (group III).

Serum amylase values were determined on admission and on following ten days (or longer if needed). Special attention was paid to initial amylase values and the duration of hyperamylasemia.

Results: In patients with stone impacted in the papilla of Vater (group I) initial amylase values (median: 1000 (IQ range: 631 to 1634)) were significantly higher than in remaining patients (median: 729 (IQ range: 491 to 1142)); p = 0.020. For levels above 1000 U, the ratio of stone impaction was 1.89 (95% CI from 1.3 to 2.7); p = 0.002. Predicted and clinical severity were not connected with any difference in admission serum amylase level.

Mean duration of hyperamylasemia was longer in patients with complicated than uncomplicated course of pancreatitis; 4 days (IQ range: 3 to 5.5) vs. 3 days (IQ range: 2 to 4) respectively; (p = 0.0006). This was true for pancreatic (p = 0.009) as well as for extrapancreatic complications (p = 0.002).

The persistence of hyperamylasemia over 4 days was connected with 3.4 times greater risk of surgical treatment due to complications (95% CI from 1.6 to 7.1); p = 0.0005, and 3.2 times greater risk of death (95% CI from 1.2 to 8.3); p = 0.012.

The duration of hyperamylasemia also reflected the treatment used. Patients treated endoscopically (group I + II) presented with significantly shorter hyperamylasemia than those managed conventionally (group III); p = 0.026.

Conclusions: (1) High admission serum amylase value (>5 times normal) could be useful in the prediction of stone impaction in patients with ABP.

(2) Prolonged hyperamylasemia seems to be connected with greater risk of complications and death in the course of ABP.

1900 The Plasma Exchange as a New Therapeutic Mean in Acute Necrotising Pancreatitis (ANP)


Several experimental and clinical studies has shown that systemic complications related to ANP are caused by circulating toxic substances originating from the damaged pancreas and probably from the RES. Plasma exchange seems to be a reasonable method for diminishing the severity of Multisystem Organ Failure (MOF) being the most important cause of death in this disease. In 8 patients went on surgery because of ANP and suffered from MOF the effect of plasma exchange was investigated in the postoperative period. The APACHE-II score, serum C-reactive protein, alpha-2-macroglobulin, and lactate dehydrogenase were determined before and after plasma exchange. There was no any complications related to plasma exchange. The APACHE-II score decreased (p = 0.05) and CRP (p = 0.05) level, LDH (p = 0.05) activity lowered and AMG (p = 0.05) level raised significantly after the procedure. We concluded that plasma exchange has probably a beneficial effect in the therapy of MOF in ANP, but further investigations are needed.
1901 Arginin-Induced Chronic Pancreatitis as an Experimental Study

At present there is no simple model for chronic pancreatitis in the rat. Although the chronic pancreatic damage caused with L-arginine in Sprague-Dawley rats is a well recognized phenomenon, in Wistar rats, the same dose of the aminoacid resulted in a surprisingly high early mortality in our preliminary study. 40 fasted male Wistar rats (b.w. 245-285 g) were used in the present study. 2 x 250 mg/100 g of L-arginine were given intraperitoneally in 1 hour interval as a 20% solution in 0.15 NaCl. The control rats received the same quantity of glycin. One glycin treated and one 250 mg/100 g arginine injected rat died. The remaining animals were killed at day 1 (8 rats), 2 (5 rats), 3 (4 rats) and pancreatic histology and as well serum amylase determinations were performed. Amylase elevations were maximal at day 1. Histology demonstrated edema, parenchymal necrosis and acute inflammatory infiltrate at days 1, 2, gradually developing to chronic subtotal atrophy with some ductular proliferation and fibrosis later on. Our modified pancreatitis model seems to be useful for examination of pathomechanism of acute and chronic pancreatitis in Wistar rats.

1902 Is Chronic Pancreatitis in the Aged Different?
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The existence of a form of chronic pancreatitis specific to the aged has been suggested. The aim of this work was to study the main characteristics of a population of aged patients and to compare them with a population of younger ones.

From January 1990 to December 1992, the 265 gastroenterologists working in 8 French departments have registered 596 cases of chronic pancreatitis. The repartition curve of cases vs age was monophasic. So, the age of 65 (mean + SD) was chosen to define the aged group (n = 123) and compare it to the younger group (n = 473).

There was no significant difference for sex (male in 85.4% of group A and 85.8% of group 2) or in the duration of symptoms (Median 7 m vs 3 m respectively). In the A group there were less previous episodes of acute pancreatitis (26% vs 54%), pancreatic pain (46% vs 79%), amylasemia >3N (20% vs 50%), but more frequent diabetes (41% vs 27%) and steatorrhoea (51% vs 36%); pancreatic calcifications were more frequent (76% vs 62%); alcoholism was less often considered responsible for pancreatitis (58% vs 74%).

In conclusion, chronic pancreatitis diagnosed after 65-years of age is more often calcified, clinically silent except for diabetes and steatorrhoea, and less often considered of alcoholic etiology. The absence of a second incidence peak in the aged population suggest however that a specific senile pancreatitis does not exist (or is very rare), but that a more slowly progressive disease (perhaps due to a lesser daily alcohol consumption) is predominant in this age group.

1903 Distribution of the Carbonic Anhydrase Isoenzymes I, II and VI in Pancreatic Tumours. An Immunohistochemical Study
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The distribution of carbonic anhydrase (CA) isoenzymes I, II and VI in normal and neoplastic pancreatic tissue was studied using polyclonal antisera and the immunoperoxidase technique. Samples were obtained from patients with well- (n = 4), moderately (n = 1), and poorly differentiated (n = 4) ductal adenocarcinomas, cystadenocarcinomas (n = 2), adenosquamous carcinoma (n = 1), acinar adenocarcinoma (n = 1), gastrinoma (n = 3), insulinoma (n = 3) and glucagonoma (n = 1). The control specimens were from a patient with traumatic laceration of the pancreas.

The normal and malignant endocrine tissue showed intense positive staining for CA I that located in the cells expressing glucagon. In the exocrine pancreatic tissue, CA I was present in the normal and neoplastic ductal epithelium. No specific staining was detected with anti-CA VI serum neither in normal nor malignant tissue.

Our results suggest that CA isoenzyme I is abundantly expressed in the malignant endocrine and adenosquamous neoplastic pancreatic duct cells. These isoenzymes may thus serve as usable marker proteins for studying the origin, invasion and metastasis of pancreatic cancers.

1904 Results of Endoscopic Drainage in the Treatment of Chronic Pancreatitis

Abdominal pain due to chronic pancreatitis (CP) is partly attributed to poor drainage and subsequent dilatation of the main pancreatic duct (MPD). Endoscopic stenting appears to be useful at reducing MPD pressure. Required duration of drainage and long term efficacy are still uncertain. We describe the results of a standardized protocol for endoscopic management of CP.

Methods: 23 patients (pts) with abdominal pain due to alcoholic CP and stricture of the MPD were treated by endoscopy according to the following protocol: after balloon dilatation of the stenosis a 10 French stent was placed into the MPD and then exchanged every 2 months, the total duration of drainage being 6 months. This protocol was chosen to decrease the rate of stent occlusion and of iatrogenic ductular lesions. Pts were seen one year after stent removal (ultrasonography, wirsungography), the effect of the treatment on pain was analyzed.

Conclusion: MPD stenting results in short-term clinical improvement in pts with CP and proximal MPD stricture. Persistence of advantageous clinical results is to be expected when the stent has resolved and is observed in 50% of pts.

1905 Relationship Between Insulin and C-Peptide Secretion and Pancreas Morphology in Patients with Chronic Ethanol-Induced Pancreatitis
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In this study we have examined 30 patients with chronic ethanol-induced pancreatitis. The aim of this investigation has been to establish a high degree function of endocrine pancreas dependent on chronic pancreatitis (CP) severity. Diagnosis of CP has been based on ultrasonography, ERCP, PABA-test as well as on determining of pancreatic enzymes in serum, urine and feces. According to obtained results, using by Cambridge international definition of pancreatography, all patients have been divided into three groups: one with CP with focal alterations (10 patients), second- CP with diffuse alterations (13 patients) and the third with pancreatic calcification (7 patients). The fourth group have been consisted of 10 healthy control subjects. The function of beta-cells has been investigated by determination of basal values of C-peptide as well as oGTT and glucagon test. All this patients had normal basal values of insulin and C-peptide. Comparing the results of oGTT and glucagon tests no statistically significant difference has been found between control group and CP with focal alterations (p > 0.05). No statistically significant difference has been found between CP with diffuse alterations and with previous episodes of CP (p > 0.05). Statistically significant difference has been found between control healthy subjects and CP with focal alterations from the one side and CP with diffuse alterations and chronic calcific pancreatitis from the other side (p < 0.01). It can be concluded that the degree of residual beta-cells capacity depends of CP severity. The difference grows up at maximal stimulation of beta-cells secretion (glucagon test).

1906 Effect of Endotoxemia on the Severity of Experimental Acute Pancreatitis
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Introduction: Systemic endotoxins is common in severe acute pancreatitis. The aim of the study was to determine changes in histology and mortality of rats with acute pancreatitis treated with different doses of endotoxin.

Methods: Male Wistar rats (mean body weight: 300 g) were used. Acute pancreatitis (AP) was induced by ligament of common pancreatico-biliary duct. Endotoxin (E) from E. coli was given intraperitoneally in 0.5 mg/kg body weight and 1.0 mg/g b w. Saline (Sa) treated and sham operated (S)- endotoxin treated animals served as control. Experimental animals were divided into five groups according to the treatments: 1. Ap + saline, 2. Ap + E 1.0 mg/kg b w., 3. Ap + E 0.5 mg/kg b w., 3. E 1.0 mg/kg b w. At 48 h after the treatment mortality rate was recorded and the pancreata
of the survivors were evaluated by light microscopy according to a grading scale from 0 to 4.

Histologic: The were no death in AP + saline, AP + E 0.5 S, E 1.0 groups, but in AP + E 1.0 group mortality was 60% (p < 0.05, chi-square test).

The histologic (mean ± SD) parameters are summarized in the table.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Necrosis</th>
<th>Inflammation</th>
<th>Hemorrhage</th>
<th>Edeema</th>
</tr>
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<tbody>
<tr>
<td>AP + Sal(s)</td>
<td>1.2 ± 0.2</td>
<td>1.6 ± 0.3</td>
<td>0.5 ± 0.3</td>
<td>1.8 ± 0.5</td>
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<tr>
<td>AP + E 0.5 S</td>
<td>1.8 ± 0.3</td>
<td>3.2 ± 0.2**</td>
<td>2.0 ± 0.5**</td>
<td>2.8 ± 0.7*</td>
</tr>
<tr>
<td>AP + E 1.0 S</td>
<td>1.3 ± 0.3</td>
<td>2.6 ± 0.3*</td>
<td>2.3 ± 0.5**</td>
<td>2.3 ± 0.3</td>
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<tr>
<td>S + E 0.5 S</td>
<td>0.2 ± 0.3</td>
<td>0.4 ± 0.3</td>
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<td>S + E 1.0 S</td>
<td>0.5 ± 0.3</td>
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*p < 0.05, **p < 0.01 (Wilcoxon’s-test). The numbers of animals are indicated in parenthesis.

Conclusion: AP is associated with an increased sensitivity to endotoxin. Endotoxin may transfer acute pancreatitis into a more severe form of the disease.

**Non Typhic Salmonella Colitis May Induce Acute Reactive Pancreatitis**

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Infectious colitis is usually a self limited disease, when non typhic salmonella bacteria are the causative agents; however we report here five cases of acute pancreatitis (2 females, 3 males; mean age 39 years) occurring in the course of this pathological condition. None of the 5 patients has been suffering from an other disease, none was taking any medication, and there was no history of alcohol abuse. The diagnosis of pancreatitis was established by an increased level of serum enzymes; amylase: mean 143 U/l (range 69-249; N < 53); lipase: mean 856 U/l (range 225-1853; N < 190); and the urinary amylase excretion: mean 155 U/l (range 290-2336; N < 250). In all cases the aminotransferase and the alkaline phosphatase activities were within a normal range. Echotomography and computed tomography were normal except in one case for which the pancreas was swollen with a necrotic area.

On a clinical point of view, in all cases, pancreatitis occurred as the diarrhea began. The colitis was self limited and resolved in few days, whereas the pancreatitis had a prolonged course, and lasted several weeks. In all cases the colitis was associated with salmonella bacteria (S. typhimurium n = 2; S. braenderup n = 1; S. enteritidis n = 1). Two facts deserve attention: in one case there was a concomitant arthritis; and 3 cases had the DR53 histocompatibility group.

Conclusions: Acute pancreatitis may occurred with self limited colitis secondary to salmonella bacteria. Their clinical and biological course is prolonged compared to the colitis. This pancreatitis may be secondary to immunogenic reactions as enlightened by the occurrence of arthritic reactions in some case and a possible HLA DR marker.

**Selective Regulation of Individual Exocrine Pancreatic Proteinases in Man**


Pancreatic secretion of hydrolytic enzymes has been extensively studied, and amylase and proteinases are known to be secreted in a non-parallel fashion in man. A more detailed examination of the feed-back regulation of different exocrine proteinases were performed using duodenal instillation of both sepa-rate and a combination of purified serine proteinase inhibitors. Activities and immunoreactive amounts of enzymes in the collected samples of duodenal juice were quantified.

Pancreatic secretion of different proteinases, amylase and lipase were demonstrated to be stimulated due to differences in inhibition profiles. Inhibi-tions of mainly trypsin activity by instillation of Kunitz trypsin inhibitor (KTI), resulted in an enhanced secretion of trypsin and lipase only. However, in-stillation of the more broad reacting Bowman-Birk inhibitor (BBI), resulted in enhanced secretion of trypsin, chymotrypsin and lipase together with pancreatic secretory trypsin inhibitor (PSTI). Secretion of elastase 1 and amylase were not stimulated by neither of the two inhibitors. A 100% inhibition of trypsin and a 80-85% reduction of total proteolytic activity by duodenal in-stillation of a mixture containing KTI, BBI and FOY-305 induced a slight in-crease in amylase as well. This non-parallel pancreatic secretion of exocrine enzymes might illustrate a safety system, allowing proper digestion of the specific food components) stimulating pancreatic secretion and minimizing the loss of endogenous proteins.

**The Effects of Prophylactic Octreotide on ERCP-Induced Pancreatic Reactions**

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Acute pancreatitis is the most serious complication after endoscopic cholangio-pancreatography (ERCP) and endoscopic sphincterotomy (EPT). Prevention of this complication has so far proven unsuccessful. The aim of this study was to evaluate the prophylactic effects of injecting patients due to undergo ERCP procedures with Octreotide. The study was carried out on 100 patients, randomly allocated in to two groups. The first group (50 pts.) received 0.1 mg of Octreotide s.c. one hour before the ERCP and two more doses 30 min hours after the second group received placebo. Clinical signs of pancreatitis were noted and, before starting the ERCP, at 6, 24 and 36 hours after the end of the procedure serum amylase levels were determined. Acute pancreatitis, in all cases mild, developed in 6% of all patients; in 8% of treated cases and in 4% of the controls (p = n.s.). 68 patients (38 controls and 30 from the treated group) underwent ERCP; acute pancreatitis was ob-served in 6.6% of treated patients (2/30) and in 2.6% of controls (1/38) (p = n.s.). EPT was performed on 32 patients (12 controls and 20 from the treated group); in Octreotide treated patients the incidence of acute pancreatitis was 10% (2/20) and in controls, it was 8.3% (1/12). In conclusion, in our experi-ence prophylactic Octreotide does not reduce the incidence of acute pan-creatitis following ERCP or EPT. More appropriate data may be obtained by studying a larger group of patients or by administering a higher dose of this drug.

**Differential Diagnostic Value of CA 19-9 Tumour Marker in Pancreatic Cancer**

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The aim of our study was to get more information about the diagnostic value of tumour marker CA 19-9. Methods: Serum level of CA 19-9 was determined by Immune RadioAssay (IRMA) in 194 patients with pancreatic malignancies or chronic pan-creatitis. All patients were surgically treated. 70 patients had a final diagnosis of pancreatic cancer and 124 had chronic pancreatitis. The diagnosis was based on cytoplogical, histology and operative macroscopic findings. Results: In 55 of the 70 patients with pancreatic cancer CA 19-9 serum level was found elevated (above 40 U/ml), and in 15 patients it proved to be normal. In the group of patients with chronic pancreatitis normal level was found in 109 cases out of 124. The serum level was elevated in 15 patients. In the present analysis the determination of CA 19-9 provided 78.6% sensitivity and 87.9% specificity. In this review we determined the diagnostic value of imaging techniques, too. The sensitivity and specificity provided by Ultrasonography was 78.6% and 90.3%, while CT yielded 81.6% and 83%, ERCP showed 90.7% and 95.8% respectively.

Conclusion: From these data we can conclude, that the determination of CA 19-9 tumour marker should be used in combination with imaging tech-niques in order to be a reliable method in the differentiation between chronic pancreatitis and pancreatic malignancy.

**The 14C-Xylose Breath Test in Chronic Pancreatitis: Evidence for Small Intestinal Bacterial Overgrowth**

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The 1-gram 14C-xylose breath test has been found to be a highly sensitive and specific test in detecting the presence of small intestinal bacterial overgrowth. To test the hypothesis that chronic pancreatitis (CP) with exocrine insufficiency may lead to bacterial overgrowth we performed the 14C-xylose breath test in CP patients with and without steatorrhoea.

Methods: 10 CP patients with steatorrhoea (> 7 g fat/d), 15 CP patients without steatorrhoea, and in 14 healthy volunteers without steatorrhoea participated in the study. Breath excretion of 14CO2 after oral administration of 5 g 14C-xylose and a gram of unlabelled xylose in 200 ml of water was de-termined at 30 min intervals during 240 minutes. All subjects were studied after an overnight fast.

Results: The cumulative breath 14CO2 excretion (expressed as percentage ± SEM) in controls was 522 ± 35, in CP patients without steatorrhoea 578 ± 46 (not statistically different when compared to controls), and in CP patients with steatorrhoea 863 ± 101 (p < 0.01 compared with controls and with CP patients without steatorrhoea).

Conclusion: These results suggest that patients with pancreatic insuffi-ciency secondary to chronic pancreatitis are prone to develop small intestinal...
1912

**Idiopathic Acute Pancreatitis (IAP) A Diagnostic Review**

M. Secchi, E. Tagliaferrì, G. Raimundo. *Surgical Division, H. Italiano and H. Provincial, Rosario, Argentina*

The IAP is that one with unknown cause or etiology. Its frequency ranges between 2% and 30% in all AP 148 AP have been diagnosed and treated prospectively from April 1987, to April 1992. At first, 18 cases were classified as IAP; their evolution was controlled from 2 to 48 months (x: 22) and their medical history was evaluated a second time. Three non alcoholic patients had an associated to alcohol large intake, prior to the attack. Thus, they were classified as alcoholic (3/18: 16%). An asthmatic patient was having prednisone and was classified as drug-induced (1/18: 5%). Four patients had recurrences, in two of them gall-bladder microtholith was found and the individual underwent surgery. Eleven patients (11/18: 61%) were considered as IAP (11/148: 7.4%) in a new group, but seven of them had undergone a previous cholecystectomy one or two years prior to the first attack; only four (4/18: 22%)/(4/148: 2.7%) had an unknown history causing AP. Sensibility of the first classification was 61%. IAP is more severe (18%) than the gallstone pancreatitis (10%) but without mortality. In conclusion: a critical review after an initial idiopathic attack in necessary in the controlled series. The first cause (unknown?) of IAP is gallbladder microtholithis, and must be meticulously looked for by iterates ultrasound, duodenal bile analysis and ERCP the results of this will be the right choice of the treatment to follow and the prevention of recurrences.

1913

**Acute Gallstone Pancreatitis (AGP) in Association with Acute Cholecystitis (AC)**

M.A. Secchi, E. Tagliaferrì, G. Raimundo. *Surgical Division B, Italian Hospital, Rosario, Argentina*

The association between AGP and AC needs a diagnostic and therapeutic approach because AC with hyperamylasemia is frequently seen. We studied a prospective series of 133 patients with AGP being 120 patients operated at the first admission. AGP and AC diagnosis were performed by clinical history, hyperamylasemia and/ or lipasemia, ultrasound, intraoperative and pathological findings. We compared this series with other series of patients who had acute biliary abdomen without AGP: n = 64 (true negatives). We had 4 false negative (AGP without hyperamylasemia) (Sensitivity 97%) and 6 false positive (Pseudo AGP) (Specificity 94%). Finally we found 18 cases of AGP associated to AC (13%: 18/120).

Most of the patients received medical treatment for a week (7.7 ± 4.7 days) and then they were operated. Mortality was 12% (2/16) and mortality was 0%.

AC had more severity prognosis in 3 cases (18%) for persistent abdominal pain and leucocytosis higher than 15,000. In these cases surgery was performed between the 3rd and 4th day after admission.

In conclusion: association between AGP and AC is not exceptional (13% of certificate cases). AGP prognosis may be more severe in 18% and an early surgery may be necessary. Post-operative morbidity is similar in comparison with AGP alone (12% and 9%. NS). Our criterion of conservative treatment is safe (none mortality) for the patient with AGP and AC is the same admission.

1914

**Atypical Pattern of Main Pancreatic Duct’s Side Branches without Pathological Substrates on Anatomical and Clinical Pancreatograms**

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When presented on pancreatograms, the main pancreatic duct’s branches are of great importance in diagnosing the minute pathological changes. Even so, some variations of these branches may give misleading in radiographic evaluation of the pancreas, and should be noted. Our study was based on 97 anatomical pancreatograms of human pancreas from autopsies, and 103 em- doscopic retrospect pancreatograms, both without pathological substrate. In only 3 cases (1.5%) atypical side branches were detected. The first one presented serpiginous branches, as chronic pancreaticitis, localized to an upper head-body segment of pancreas. The second case involved a ductal bridge over the main pancreatic duct, as in pancreatitis with stenosis of the main duct. In the third case there were two vertical upward branches for the uncinate process, which resembles the picture of pathological displacement.

**Conclusion:** Though rare as a finding, atypical patterns of main pancreatic side branches might produce misinterpretations of otherwise normal clinical pancreatograms.

1915

**A Useful Method for the Diagnosis of Infected Pancreatic Necrosis: The TC99m-HM-PAO-Leukocyte Scintigraphy**

T. Takác, M. Papos1, J. Láng 1, L. Csernay 1, Gy. Farkas 1, L. Nagy, J. Lonovics. *First Department of Medicine, A. Szent-Györgyi Medical University, Szeged, Hungary; 2 Department of Nuclear Medicine, A. Szent-Györgyi Medical University, Szeged, Hungary; 3 First Department of Surgery, A. Szent-Györgyi Medical University, Szeged, Hungary*

Numerous attempts have been made to achieve a reliable prognostic assessment in the early phase of acute pancreatitis. However, the results of these tests (clinical features, laboratory parameters, imaging techniques in several variations) have been disappointing in prospective studies. The aim of our work was to evaluate the prognostic role of Tc99m-HM-PAO-leukocyte scintigraphy in the early phase of acute pancreatitis and those with complications.

**Patients and Methods:** 31 leukocyte scintigraphies were performed. Mixed leukocytes were labeled in vitro with Tc99m-HM-PAO. Images were taken from the abdomen 30 minutes, 2 and 4 hours following the replacement of the labeled cells. In group 1, 20 consecutive patients with acute pancreatitis (at least threefold elevation of serum amylase level as well as typical findings in ultrasound and/or computed tomography) were tested. Scintigraphy was performed in all patients during the first week of hospitalisation (mean: 4.3 days). In group 2, 11 patients were tested with pancreatic pseudocyst following acute pancreatitis. Clinical features, laboratory parameters and outcome were registered during the hospitalisation.

**Results:** In group 1, scintigraphy showed an abnormal accumulation of leukocytes in the peripancreatic area in 7 patients. Median duration of hospitalisation of these patients was significantly longer (mean: 25/16–48/6 days) than those with negative scintigram (mean: 13/5–24/4 days). 4 patients with positive leukocyte scan had an infected pancreatic necrosis confirmed by surgery and bacterial culturing, the other 3 patients were successfully treated with antibiotics. Scintigraphy was normal in 13 patients with favorable outcome without antibiotic treatment. In group 2, among the 11 patients with pancreatic pseudocysts there were 4 cases with positive leukocyte scan. Pancreatic abscess was found in 3 of them during surgery. 2 out of 7 patients with normal scintigram, surgery revealed a non-infected pancreatic pseudocyst.

**Conclusion:** Leukocyte infiltration into the pancreas can be demonstrated by Tc99m-HM-PAO-leukocyte scintigraphy. Positive leukocyte scan indicated a severe course of acute pancreatitis with special need of antibiotic and/or surgical treatment. The method also seems to be useful for the differentiation between the infected and noninfected pancreatic pseudocysts.

1916

**Don’t Miss Eosinophilic Pancreatitis**

J. Testart, S. Perrot, J. Metayer, C. Peillon, N. Roulle. *CHU, 76031 Rouen, France*

Among 5 cases already published and 2 new cases we observed, a preoperative diagnosis of eosinophilic pancreatitis (EP) was evoked only in one. The 6 others were treated surgically as if they were cancer (3 Whipple’s procedures, 2 splenopanreatococtomies, 1 palliative bypass). Simulating cancer were pictures of duodenal compression and stiffness (3 cases) or of irregular bile duct stenoses (2 cases) and above all the operative discovery of a very hard and enlarged pancreas. The pancreatic enlargement was total in 3 cases, left sided in 2, right sided in 1, non precisely in 1.

EP is characterized by a homogenous hypoechogenic hypetrophy on U.S., hypodense on X-Rays with regular narrowing of the pancreatic ducts and without calcification or cyst which make it quite different from the usual chronic pancreatitis.

As for eosinophilic gastroenteritis of which EP is a particular extension, the diagnosis can rely neither on demography (from 21 to 70 years of age) nor on an allergic history (3 cases only) nor on blood eosinophilia, which is variable and non specific. It can rely only on histology. In 6 of the cases the massive pseudotumoral eosinophilic infiltration has been demonstrated in some place (s) of the digestive tract walls. But it is often irregularly strown among the 3 layers. Among 5 cases of EP which have had endoscopic biopsies only 2 had a positive result. That emphasishes the need of multiple biopsies.

A correct diagnosis would avoid needless exereses and lead to a useful steroid therapy.

1917

**Surgical Treatment of Pancreatic Cancer. Possibilities and Pitfalls in Diagnosis**

T. Tihaný, L. Horvath, Z. Rusz, L. Flautner. *1st Surgical Department of Semmelweis Univ. of Medicine, Budapest, Hungary*

Between January 1989 and December 1993 645 patients out of 727 with pancreatic carcinoma were treated surgically at the 1st Surgical Dept. of the Semmelweis University of Medicine. Radical operation was performed in 16.5% of the cases including partial or total pancreaticoduodenectomy and distal re-
section. In the rest of the patients only different types of palliative procedures could be performed. Overall mortality rate amounted to 6%, while hospital mortality could be kept as low as 3.4%. The retrospective analysis covered the diagnostic procedures – ultrasonography, computed tomography, ERCP, tumor marker CA 19-9 and fine needle aspiration biopsy – pre- and postoperative staging. 85% of the patients in the nonresected group had stage III and IV pancreatic cancer, 15% were classified as stage II, and were considered unresectable because of local spread. In the resected group it was surprising to find upon pathologic examination, that in spite of the resectability of the tumor 8% of the patients were classified having stage III-IV: 35% stage II and 57% stage I cancer, respectively. Overall mean survival of the resected group was 16 months. It seems that early pancreatic cancer is a rare clinical finding. This might be due to the lack of characteristic symptoms and the uncertainty of the diagnostic procedures in our experience.

1918  Endoscopic Treatment of Pancreatic Diseases

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Introduction: Strictures, stones and pseudocyst impair the normal outflow of pancreatic juice in chronic pancreatitis (CP) and may cause pain and/or recurrent attacks of acute pancreatitis (AP). Patients with these problems must be treated. One of the possibilities is a surgical intervention a second is endoscopic treatment: pancreatic papillosphincterotomy (PPS) stenoses dilatation, stones extraction, lithotripsy and stenting. In this non-randomised single centre study evaluated the endoscopic management of these problems.

Materials and methods: In the Clinic of Gastroenterology 40 PPS have been done. There were 27 men and 13 women with a mean age 56.6 years (range 25-85). Indication for PPS was CP 34 times (from this PPS of papilla duodenini minor was done 4 times). Stenosis of pancreatic duct with major prestenotic dilatation was seen in 16 patients with CP After PPS was done extraction of stones or drainage (pancreatic duct or pseudocyst). The attempt of drainage of pancreatic duct was done 16 times and was successful 12 times.

Results: In 10 patients with CP after pancreatic duct drainage the pain significantly decreased in 1 patients only mild change of the pain could be seen and in 1 patient the pain was very strong and did not decrease after the drainage. Therefore he was indicated for surgery.

Conclusion: Our experiences with a small number of patients with painful CP demonstrated good results after pancreatic duct drainage. Recurrent attacks of AP after the drainage were not seen in 83.3% of our patients and their pain decreased significantly. In some patients could be seen dilatations of pancreatic three after removing of pancreatic stent.

1919  Prostogene: Preconditions for its Usage in Treatment of Chronic Pancreatitis

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The cytoprotective action of prostanoids (PG) in inflammatory lesions of pancreas, along with their ability to modulate exocrine pancreatic secretion prompted us to examine the effects of Prostogene (P), PGD2 derivates, in chronic pancreatitis (CP).

52 patients with mild manifestations of CP recurrence and 19 healthy volunteers were studied. The effects of intravenous P (Tallinn pharm. factory: 0.08 mg/kg/min for 40 min) on basal and Enzaprost F-stimulated (PGF2α: 0.4 mg/kg/min) gastric HCl secretion, pancreatic enzymes’ activities, Na bicarbonate output, pancreatic juice (PJ) volume, and cyclic nucleotides (CN) levels in PJ were tested.

Administration of P to volunteers resulted in quick (in 20 min) but short-term (for 40 min) increase in Na bicarbonate production and PJ volume (p < 0.05). Enzymes activities, CN contents in PJ and HCl secretion did not change. Pretreatment with Enzaprost F caused growth of enzymatic activity in PJ and HCl secretion in both groups. This effect was abolished by P (p < 0.05), which, however, did not suppress Enzaprost-stimulated rise in PJ output and bicarbonate production. P was also found to relieve pain. Analgesia started 20–30 min after the beginning of the infusion, lasted for up to 1–3 days and was mostly related to relaxation of smooth muscles verified by ultrasonographic examination.

Thus, P appears to stimulate directly (without CN involvement) H2O and bicarbonate secretion, relieve pain and provide a "functional relaxation" for the acinar cells under stimulation. These properties of the drug may be helpful in treatment of CP patients.

1920  Vagal Tone and Antral Size in Duodenal Ulcer and Functional Dyspepsia Patients

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Patients with functional dyspepsia (FD) are characterized by low vagal tone and wide gastric antrum compared to healthy controls (C) (Scand J Gastroenterol 1992; 27: 427–432, Psychosom Medicine 1993; 55: 12–22). The aim of the present study was to investigate vagal tone and antral size in patients with duodenal ulcer (DU). Methods: Sixteen consecutive patients with endoscopically verified DU and Helicobacter pylori infection were investigated the day after endoscopy. No patients received any ulcer treatment. All subjects were investigated fasting in the morning. The antral width was measured ultrasonographically in a standardized vertical section, and measurements of respiratory sinus arrhythmia (RSA) was calculated to index vagal tone. The results were compared to those in 25 patients with FD and 25 C similarly examined previously. Results: Vagal tone was significantly higher in DU (1.2) and C (5.7) compared to FD (1.9) (p = 0.001). DU patients tended to have higher vagal tone than C (p = 0.07). Fasting antral area was significantly wider in DU (4.8 cm2) and FD (4.6 cm2) than in C (3.4 cm2) (p = 0.01). Conclusions: DU patients are characterized by high vagal tone compared to functional dyspepsia patients. Both groups have a wide gastric antrum; possibly due to a functional disorder in FD and to a mechanical outlet obstruction in DU.

1376  Does Systemic Absorption of 5-Aminosalicylic Acid from Olsalazine (Dipentum®) and Mesalazine (Asacol® and Pentasa®) Differ Significantly in Ulcerative Colitis?

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5-Aminosalicylic acid (5-ASA), the active moiety of sulphasalazine, formulated as the azo-bonded analogue olsalazine (Dipentum®), or as delayed release or slow release mesalazine (Asacol® (A) and Pentasa® (P)), is effective in prevention of relapse in ulcerative colitis. However, significant systemic absorption of 5-ASA may make it less effective and may increase adverse effects.

Method: We compared the systemic absorption of D, A and P at steady state. 15 patients (age 21–69 y, 6 female) with ulcerative colitis in remission were given in a randomised block design 7-day courses of D 1.0 g/d, A 1.2 g/d, and P 1.5 g/d. Plasma and urine were collected on days 6 and 7 of each course and analyzed for 5-ASA and its main metabolite, acetyl-5-ASA, by HPLC.

Results:

Mean (SEM) plasma and urine 5ASA and Acetyl-5ASA in 15 patients

<table>
<thead>
<tr>
<th></th>
<th>Dipentum</th>
<th>Asacol</th>
<th>Pentasa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plasma 5-ASA (μmol/l)</td>
<td>1.48(0.35)*</td>
<td>3.76 (1.27)</td>
<td>1.35 (0.21)</td>
</tr>
<tr>
<td>Acetyl-5-ASA (μmol/l)</td>
<td>3.51 (0.57)*</td>
<td>7.90 (1.36)</td>
<td>5.29 (1.26)</td>
</tr>
<tr>
<td>Urine 5-ASA (μmol/24 h)</td>
<td>53.1 (22.8)*</td>
<td>149 (40.8)</td>
<td>252 (65.7)</td>
</tr>
<tr>
<td>Acetyl-5-ASA (μmol/24 h)</td>
<td>1180 (136)*</td>
<td>1730 (132)</td>
<td>3190 (266)</td>
</tr>
<tr>
<td>Total 5-ASA (μmol/24 h)</td>
<td>1230 (151)*</td>
<td>1880 (155)</td>
<td>3450 (272)</td>
</tr>
<tr>
<td>Equimolar 5-ASA % dose</td>
<td>21.3 (2.6)*</td>
<td>24.0 (1.98)</td>
<td>35.1 (2.77)</td>
</tr>
</tbody>
</table>

*p < 0.01 compared with A, **p < 0.001 compared with P

Conclusions: 5-ASA and acetyl-5-ASA in plasma and urine during olsalazine (Dipentum) treatment were significantly lower than with the two mesalazine formulations (A and P). At therapeutic doses olsalazine appears to have the least systemic absorption at steady state.

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