Short report

Alpha$_1$-antitrypsin bodies, Pi$^z$ phenotype, and peptic ulcer

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**SUMMARY** An association between chronic peptic ulcer and heterozygous a$_1$-antitrypsin deficiency has been reported: this study found no evidence of such an association. The prevalence of a$_1$-antitrypsin bodies in the liver was compared with the known prevalence of Pi$^z$ phenotype in the population: there was no significant difference.

The production of a$_1$-antitrypsin, the major trypsin inhibitor in the blood, is controlled by alleles—the normal being Pi$^{MN}$. Probably all persons with a Pi$^Z$ allele have typical periodic acid-Schiff positive, diastase resistant, rounded bodies in the cytoplasm of their hepatocytes (Blenkinsopp and Haffenden, 1977), and these bodies rarely occur in persons with normal Pi$^{MM}$ phenotype (Bradfield and Blenkinsopp, 1977).

Andre *et al.* (1974) reported that 10·5% of 114 patients with chronic duodenal ulcer, and 9·6% of 83 with chronic gastric ulcer, had levels of a$_1$-antitrypsin in the heterozygous (Pi$^{MZ}$) range, compared with 3·3% of 118 controls. The figure for patients with duodenal ulcer was statistically significantly different from that for controls, but that for gastric ulcer was not. However, normal levels of a$_1$-antitrypsin in the serum are scattered over a wide range, and the arbitrary choice of a cut-off at 60% of the mean normal value may be unsatisfactory. The presence of a$_1$-antitrypsin bodies in the liver provides a sharp discriminant, and this was used to investigate in necropsy material whether there was an increased prevalence of a$_1$-antitrypsin deficiency in patients with peptic ulcer.

**Methods**

Paraffin sections of formalin-fixed liver tissue taken at necropsy from patients with chronic gastric ulcer (72), chronic duodenal ulcer (52), or acute gastric ulcer (25), and from 159 patients without peptic ulceration were stained with periodic acid-Schiff after diastase. Patients with chronic liver disease were excluded. All positive cases were checked by immunoperoxidase, using anti-human a$_1$-antitrypsin (Behringwerke) and the peroxidase-antiperoxidase method. All cases positive on periodic acid-Schiff/diastase staining were also positive on immunoperoxidase staining.

**Results and comment**

The results are shown in the Table, which also gives the results in a previous control series (Blenkinsopp and Haffenden, 1977). Chi-square tests revealed no significant difference between any test group and the controls, and thus no evidence of an association between a$_1$-antitrypsin deficiency and peptic ulceration.

Summation of the results gave a prevalence of a$_1$-antitrypsin bodies of 3·8% in 418 cases without liver disease. Addition of the estimated number of cases with liver disease (Blenkinsopp and Haffenden, 1977) gave a prevalence of a$_1$-antitrypsin bodies in the hospital necropsy population of 4·1% in 424. This frequency was compared with that of 26 in 700.
necropsies found by Eriksson et al. (1975) and with
the frequency (3.23%) of Pi² allele found on serum
phenotyping of about 10 000 samples in England
(Cook, 1974), and chi-square tests showed no sig-
nificant differences. This study therefore suggests
that most persons with a₁-antitrypsin bodies in the
liver have a Pi² phenotype.

References

Prevalence of alpha₁-antitrypsin deficiency in patients with
gastric or duodenal ulcer. Biomedicine, 21, 222-224.
antitrypsin bodies in the liver. Journal of Clinical Pathology,
30, 132-137.
Bradfield, J. W. B., and Blenkinsopp, W. K. (1977). Alpha-1-
antitrypsin globules in the liver and PiM phenotype.
Journal of Clinical Pathology, 30, 464-466.
Eriksson, S., Moestrup, T., and Hägerstrand, I. (1975). Liver
lung and malignant disease in heterozygous (PiMZ) a₁-

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