since been shown to have impaired synthesis of metallothionein in culture fibroblasts.1 3 In our case, however, basal and metal induced metallothionein synthesis in skin fibroblasts was normal,1 3 indicating that heterogeneity exists among cases of primary, non-environmental, non-Wilsonian copper toxicosis.

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Eradication rate of Helicobacter pylori

EDITOR—The paper by Moshkowitz et al (Gut 1995; 36: 845–7) suggesting that the pretreatment 14C-urea breath test results are related to the outcome of triple therapy consisting of colloidal bismuth, metronidazole, and amoxicillin raises several points. Unfortunately, the authors did not include confounding variables such as compliance, pretreatment smoking, age, gender, antibiotics and anti-secretory drugs, any one of which may have an important effect on the outcome of eradication therapy. Another weakness of this particular study is that the authors did not prove the correlation between the urea breath test and histology, although biopsy specimens were taken for histological examination in all patients. On the basis of previously published comparative studies between breath test results and histology, the authors concluded that the density of H pylori that predicts the outcome of eradication therapy. We cannot agree with this conclusion.

Furthermore, the urea breath test, as an indirect measure, may reflect the total gastric urease activity, however, urease activities may vary considerably between H pylori strains1. Thus, in clinical practice the accurate prediction of the H pylori density by the urea breath test will in all likelihood be the exception rather than the rule.

Several studies have shown that a significant correlation does exist between urea breath test results and the density of H pylori infection and the severity of gastritis. But what does a significant correlation imply clinically? Because of the high sensitivity of statistical tests in correlation analyses, rather weak correlations may result in statistical significance. It is, however, the determination coefficient (squared correlation coefficient) that reflects the proportion of results that have been predicted properly when one of two correlated variables is known. For example, we have found highly significant correlations (p < 0.0001) between the 13CO2 excess after intake of labelled urea and the histologically visible degree of H pylori colonisation (r = 0.81), the density of H pylori (r = 0.72) and the activity of gastritis (r = 0.69) as well.7 These correlations showed that the histological findings would have been predicted properly in 66%, 52%, and 48% of cases, respectively, which is of course clinically not very useful. It should also be mentioned that some of the studies quoted by Moshkowitz et al that were published only as abstracts, which do not permit the estimation of the clinical relevance of the correlations, because the correlation coefficients are not given.

Previous studies have suggested that the density of H pylori determines both the grade and the activity of gastritis.4 5 Recent studies have also shown that the severity of gastritis predicts the success of eradication therapy with triple therapy as well.8 9 Despite this, the dual therapy consisting of omeprazole and amoxicillin9 in the sense that a more severe gastritis is associated with a higher likelihood of eradication success. Grade and activity of gastritis reflect the specific immune response of the host to the infection with H pylori. Although scientifically unconfirmed up to now, it seems plausible that comparable to other infectious diseases it is the immune response that facilitates eradication of H pylori whatever treatment is used. Provided the urea breath test used by Moshkowitz et al does actually reflect the H pylori density and thus in turn the severity of gastritis, the finding of a higher eradication rate in patients with lower urea breath test values is in apparent contradiction to the studies quoted above.

In conclusion, despite a significant correlation between breath tests with respect to prediction of H pylori density and severity of gastritis remains yet unproved and such predictions should be used in clinical practice with caution. Also without exclusion of confounding variables by means of multiple logistic regression analysis it is actually impossible to identify a single factor independently governing the success of eradication therapy.

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Eradication rate of Helicobacter pylori.

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Gut 1995 37: 591-592
doi: 10.1136/gut.37.4.591

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