PIVKA-II concentrations in patients with cystic fibrosis

Montalembert et al report that PIVKA-II was detected in 33% of patients with cystic fibrosis, while vitamin K, plasma concentrations were normal.1 It is astonishing that data for the determinations of 5-10 mg vitamin K, PIVKA-II was detectable in these patients. The authors conclude that PIVKA-II is not associated with vitamin K deficiency, but with the use of antibiotics.

There is some doubt as to whether the assay for PIVKA-II used by the authors is reliable. Widdershoven et al compared different methods for measuring PIVKA-II and reported that techniques involving adsorption of normal factor II may result in false positive values, because the carboxylated prothrombin may not be removed completely.2 Determination of PIVKA-II by monoclonal antibody was found to be the most specific and sensitive method.2 We did not detect PIVKA-II in any of eight patients with cystic fibrosis who were supplemented with vitamin K (4–30 mg/day).1 In only one out of four unsupplemented patients with cystic fibrosis, PIVKA-II was found (0.16 AU/ml). This patient took antibiotics, had a low vitamin K concentration of 0.06 μg/ml and a Thrombostest of 56%.6 The authors do not mention the level of vitamin K.

Except for vitamin K, vitamin K must be accounted for when assessing vitamin K status. Antibiotics may disturb vitamin K production by intestinal flora and hence reduce the amount of total vitamin K available for the carboxylation of PIVKA-II to functional factor II. A correlation between subnormal coagulation tests and antibiotics in cystic fibrosis was reported by Komp and Selden.5 As there was no information on concentrations of vitamin K, it is impossible to establish normal values for vitamin K, PIVKA-II, however, is a direct reflection of the availability of total vitamin K in the liver and hence it is associated with vitamin K deficiency. In our study PIVKA-II was found in only one unsupplemented patient with cystic fibrosis, and hence we conclude that vitamin K deficiency occurs infrequently in cystic fibrosis.2

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5 Dr Lefrere et al comment: Our PIVKA-II assay, based on the activity of staphylocoagulase, is widely used in many laboratories. The results obtained with this procedure with those of laboratories measuring PIVKA-II with monoclonal antibody, in particular in patients with hepatocellular carcinoma.2 6 Furthermore, we measured PIVKA-II concentrations in a large population of healthy individuals (blood donors) and obtained no false positive result in these individuals.
6 Dr Cornelissen et al do not raise the possibility of increased PIVKA-II in contexts other than vitamin K deficiency, such as hepatothelial carcinoma,3 staphylocoagulase,4 5 hepatothrombocytopenia,6 effect of oral anticoagulants7 and cephalosporins.8 Indeed, vitamin K deficiency is not the only mechanism to generate PIVKA-II. In hepatocellular carcinoma increased PIVKA-II concentration is probably due to an acquired enzymatic anomaly which disturbs the γ-carboxylation of all vitamin K dependent factors.3 9 We could not explain this increase in our patients with cystic fibrosis and without vitamin K deficiency. This increase might have been linked to the interference of certain drugs on the enzymatic system of γ-carboxylation of vitamin K dependent factors.
7 Dr Cornelissen does not say if the eight patients they studied with a normal PIVKA-II concentration received certain drugs (such as antibiotics). However, we agree with his conclusion: vitamin K deficiency is rare in patients with cystic fibrosis supplemented with vitamin K.

Modifying the request behaviour of clinicians

In their recent paper, Gama et al report that feedback of laboratory data to clinicians modified their request behaviour for clinical chemistry and haemostasis tests (reduced the numbers of tested requests). The authors clearly imply that this modification was a good thing. Their opening sentence refers to "...strategies for improving (my emphasis) laboratory use", and in the discussion they state that their results support the view "that the physicians had become more judicious (my emphasis) in their laboratory use".

In a partly similar study Bareford and Hayling4 sent each consultant a monthly statement of use of the laboratory by his firm, compared with that of other clinicians. This practice, with three other interventions, they conducted, resulted in a significantly lowered percentage of request for laboratory investigations. In my opinion, both groups are falling into the trap of making unjustified value judgements based on evidence for only one half of the equation: less tests = better/no worse treatment. Modifications in clinicians' laboratory testing behaviour patterns can only be regarded as desirable or "judicious" if it can be ascertained that such modified behaviour can be demonstrated to improve patient care, or at least to result in no worse care. Similarly, requests can only be claimed to be "inappropriate" if it is shown that clinicians' reduced requests for laboratory testing were not giving their patients worse care than before as a result of curtailing their laboratory requests. In fact, Gama et al's statement that as a result of their initiative "fewer outpatient requests were investigated, and when investigated had fewer tests performed on them" would suggest, prima facie, that these patients were receiving worse medical treatment than before.

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Dr Gama et al comment:
There is ample evidence that many laboratory investigations may be unnecessary for adequate patient care1 and that the recent increased laboratory use has not been associated with an improvement in patient outcome.2 In our study, unlike Bleacher, we made no unfounded assumption about the quality of patient care. Although we were unable to assess clinical outcome: we agree with Bleacher that this, in practice, would be almost impossible to achieve. We believe it unlikely that the reduction in laboratory use through more thoughtful and discretionary ("judicious") testing adversely affected patient management. The fact that fewer outpatient requests were investigated suggests that clinicians were not requesting unnecessary tests in venepunctures (considered unnecessary by the attending physician) and this, contrary to Bleacher's assertion, represents an improvement in the quality of patient care.

Motivation for improving laboratory use should not be limited to better quality of patient care but should also include more efficient use of laboratory resources.3 4 In our study, unlike Bleacher, we believe that this involves tackling not only laboratory overuse5 but also underuse6 and misuse. Gama R, Pickford R, Jones SR, Mc Caulhey B, Peters M. Proceedings of the ACB national meeting, 1990:63.
Correspondence


AgNOR technique in relation to colorectal neoplasia

We read with interest the recent paper by Beer et al.1 because we have also applied this technique to intestinal tissue. This paper is one of a selection that has been published on this topic in recent years in which authors express varied enthusiasm for the method.2-4

We examined 91 surgical resection specimens of large bowel comprising normal mucosa (n = 10), tubular (n = 18), villous (n = 6) and tubulo-villous (n = 16) adenomas, and moderately differentiated adenocarcinomas (n = 22). The batch of malignant tumours comprised five Dukes' A, six B, and 11 C tumours as described by Smith and Crocker, except that the staining time was one hour; 100 cells were counted.

The results are shown in the table. An unpaired t test was applied to the data and a highly significant difference (p = 0.001) was found between normal mucosa and both the adenomatous polyps and the adenocarcinomas. No statistical difference existed between normal and metastatic, or between benign and malignant conditions. AgNOR numbers varied enormously in all but the normal and metastatic states, this being most pronounced in malignancy (figure). No correlation was observed between the AgNOR number and the Dukes' stage, although we acknowledge that relatively few of each stage were examined.

In terms of diagnostic usefulness, our results for colorectal tissue agree with those of Beer et al.1 We, therefore, propose to use the AgNOR count in vivo to distinguish normal tissue from neoplastic. However, as an accurate discriminator of malignancy, this technique is inadequate when applied to intestinal tissues. We feel that it offers little more than the haematoyxlin and eosin preparation in the large bowel disease diagnostic pathology.

Breast biopsy specimen fixation

Further to the correspondence by Drs Start, Cross, and Smith2 regarding the procedure of fixing breast biopsy specimens, we add our findings to this debate.

In our view the handling of this kind of specimen poses a dilemma: for best slicing and minimisation of distortion for assessment of resection margins and extent of lesion, the specimen should be fixed before slicing. To overcome this problem we suggest that the specimen should be injected with 10% neutral buffered formalin on receipt then left to fix for 24 hours before slicing.

We use a 10 ml syringe with a 21 gauge needle. The amount of formalin injected depends on the size of the specimen. The injection can be performed by technical staff, which means the specimen need not be sent dry and the pathologist does not have to be on hand when the specimen is received: this may often be the case in a district general hospital.

This technique offers adequate fixation of tissues deep within the specimen while allowing fixation of the outside which "hardens" the specimen, giving optimal slicing.

There are two possible hazards that need to be borne in mind when using this technique. The first is the danger of needlestick injuries to the second concern - the splashback of formalin which can occur if too much pressure is applied, particularly when injecting firm areas of tissue. Accordingly, appropriate protective clothing should be worn and great care taken when performing this procedure.

We have found a definite improvement using this method in the quality of morphology in subsequent sections compared with those from specimens which were allowed to fix overnight before slicing and were not injected.

We propose that this method helps reduce the inevitable variation in fixation that occurs with these specimens, and thereby reduces the associated variation in mitotic counts which may affect grading.5 It also improves assessment of resection margins and extent of lesions.

We accept that our findings are subjective and anecdotal, but feel that there is sufficient benefit to merit extending the use of this procedure from localisation biopsy specimens and wide local excision specimens to mastectomy specimens.
Modifying the request behaviour of clinicians.

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