ratio allowed discrimination between viral and bacterial infection. Consequently, concurrent determination of serum neopterin and CRP in the follow-up of heart-transplant recipients may help detect postoperative infection.

References

Discordant hCG Measurements in a Patient with a Carcinoma, A. T. Remaley, M. Bulley, M. B. Senior, and D. B. P. Goodman (Dept. of Pathol. and Laboratory Medicine, Hospital of the University of Pennsylvania, Philadelphia, PA 19104)

In a parallel study of the Abbott-IMX microparticle enzyme immunoassay and the Serono immunoradiometric assay for human choriogonadotropin (hCG), we found a marked discrepancy in the results for hCG in serum of one of the 457 patients studied. Overall, hCG by the Abbott-IMX method (y) correlated closely (r = 0.87) with hCG by the Serono method (y = 1.2 + 0.72x; n = 69; range 5-100 int. units/L). One patient, however, had values of 14, 14, and 22 int. units of hCG per liter by the Serono method for three separate serum samples, but had undetectable hCG concentrations (5 int. units/L) in the same samples by the Abbott-IMX method.

The patient, a 61-year-old white man with carcinoma of the prostate, was initially treated in 1985 with local radiation and radioactive implants. In 1988, he developed difficulty in voiding and had a radical cystoprostatectomy for presumed residual prostatic carcinoma. At that time, a poorly differentiated metastatic squamous-cell carcinoma of the bladder was also discovered. Shortly after the surgery, the patient developed gynecomastia and was then first noted to have an increased hCG concentration.

The patient was not castrated, nor did he receive any hormonal therapy. He had a normal concentration of lutein (5.7 int. units/L), which can cross-react with some hCG assays. Furthermore, the samples were not hemolyzed or lipemic, and addition of purified murine immunoglobulins to the samples did not lower the Serono hCG results, thus also excluding sample-interference problems or anti-hCG antibodies as the cause for the increased hCG.

We speculate that the discrepant results for hCG observed with this patient are ascribable to differences in the methodology used in the two hCG assays. The Abbott-IMX method is a two-site immunoassay that involves both an anti-alpha and an anti-beta subunit antibody and only detects the intact dimeric form of the hormone. The Serono method involves only anti-beta antibodies and detects both the intact dimer and free beta subunit of hCG. Production of excess free beta subunit of hCG by either one of the patient's tumors would explain the discordant results. Immunochemical staining of the patient's tumors for the beta subunit of hCG were negative, but this does not exclude the possibility that the tumors are producing low amounts of hCG that are not detectable by immunochemical stains, which is consistent with the relatively minor increase in the hCG in the serum of this patient. Numerous tumors, including carcinomas of the prostate and the bladder, reportedly produce hCG (1, 2), and on occasion tumors produce either excess free beta subunit or, more rarely, excess free alpha subunit (3-5).

This case nicely illustrates a potential pitfall in the use of two-site immunoassays of intact hCG: the inability to

Fig. 1. Neopterin (O) and CRP (C) concentrations during the postoperative period in (left) a patient who developed herpes infection and (right) a patient who developed urinary infection (day 4) and experienced a moderate acute rejection episode (day 14). The herpes patient developed vesicles on day 9; the peak neopterin/CRP ratio (day 12) was 3.3.
detect aberrant production of free hCG subunits by tumors. Because of the increasing popularity of two-site immunoassays, it is important to recognize this limitation of the assay and to provide alternative methods that detect free subunits of hCG whenever there is a discrepancy between the clinical findings and the results of hCG by two-site immunoassays.

References

Multicentre Evaluation of the Boehringer Mannheim/Hitachi 717 Analysis System, H. Baaddenhuysen, 1 P.M. Bayer, 2 H. Keller, 3 M. Knedel, 4 N. Montalbetti, 5 S. Brenna, 6 L. Precincipe, 7 A. Vassault, 6 M. Bailly, 6 H.T. Phung, 6 W. Bablok, 7 W. Poppe, 7 W. Stockmann 7 (1 St. Radboud Ziekenhuis, Nijmegen, The Netherlands; 2 Wilhelminen-Spital, Vienna, Austria; 3 Kantons-Spital, St. Gallen, Switzerland; 4 Klinikum Grosshadern, Munich, F.R.G.; 5 Ospedale Niguarda-Ca' Granda, Piazza Ospedale Maggiore 3, 20162 Milan, Italy; 6 Hôpital Necker, Paris, France; and 7 Boehringer Mannheim GmbH, Mannheim, F.R.G. Address correspondence to S.B.)

We carried out a multicenter evaluation of the Boehringer Mannheim/Hitachi 717 analysis system in six European laboratories by a protocol reflecting the ECCLS recommendations for instrument evaluation (1).

Photometer linearity ranged up to absorbance 2.8. Maximum CV of photometric imprecision was 0.5% for the wavelengths pair 340/405 nm within the absorbance range of 0.9 to 2.4. For the 13 analytes considered in our study, the mean within-run CV, tested with three control sera and a human serum pool with concentrations or activities at the decision level, was <2%. The mean between-day CV over 21 days was <2.5% (Figure 1). The highest value for within-run CV was 2.3% (creatinine and urea), for between-day CV, 4.5% (uric acid). We compared results from the Hitachi 717 with those obtained with the Hitachi 737 and Hitachi 704. In total the multicenter comparison study yielded 76 regression equations; 69 of them were within the acceptable limits (slope: <5% from unity; intercept: 5% of the decision limit adequately settled for every analyte). During 8 h of the drift experiment none of the analytes showed more than 5% deviation from the respective initial values. There was no appreciable sample carryover for any analyte and no systematic interference due to reagent carryover was detected in alanine aminotransferase/lactate dehydrogenase or cholesterol/uric acid pairs.

Reference
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Use of the Polymerase Chain Reaction for Simultaneous Analysis of Two Pst I Polymorphisms Linked to Cystic Fibrosis, W. Edward Highsmith, Jr., Tenly R. Perry, Thomas W. Prior, and Laurence M. Silverman (Dept. of Lab. Med. and Pathol., North Carolina Memorial Hosp. and Univ. of North Carolina School of Med., Chapel Hill, NC 27599)

The specific gene defect responsible for cystic fibrosis (CF) is not yet known. Currently, and until the gene is identified, prenatal diagnosis is performed by using restriction fragment length polymorphisms (RFLPs), which have been shown to be tightly linked to the CF locus (1). Family studies involving RFLPs have traditionally been performed by the Southern blot technique. Recently, the polymerase chain reaction (PCR) has been shown to overcome many technical problems associated with this technique, including lengthy analysis times and the need for high-energy beta emitters such as 32P (2). Primer sequences flanking several polymorphic restriction sites tightly linked to CF have been reported, including KM-19, CS.7 (two loci within the IRP gene) (3, 4), and JG3C (located near the J3.11 locus) (5).

Both KM-19 and JG3C identify polymorphic Pst I sites. Furthermore, they flank the CF gene. The use of flanking markers in RFLP analysis decreases the error rate associated with recombination. In this report, we describe the simultaneous amplification of the regions of DNA defining the KM-19 and JG3C loci and the restriction analysis of both loci on a single gel.

PCR was carried out on 1 μg of human chromosomal DNA in the presence of 300 ng of each of the four oligonucleotide primers (sequence as given in references 3 and 5), 1.5 mmol/L deoxynucleotide triphosphates, 5 mmol/L MgCl2, 67 mmol/L Tris (pH 8.8), 10 mmol/L 2-mercaptoethanol, 16.6 mmol/L ammonium sulfate, 6.7 μmol/L