C-reactive protein levels in ectopic pregnancy, pelvic infection and carcinoma of the cervix

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Summary

The value of C-reactive protein (CRP) levels in the differential diagnosis of pelvic infection and ectopic pregnancy, in the staging of carcinoma of the cervix, and after necrotizing irradiation for tumour was assessed. CRP was measured using a sensitive magnetizable solid-phase immunoradiometric assay. There was an obvious difference in CRP levels between patients with ectopic pregnancies and acute pelvic infections, but CRP levels failed to differentiate between stages IIB and IIIB carcinoma of the cervix, the majority of patients not having a significant acute-phase response. During radiotherapy there was wide variation and substantial individual differences in CRP levels which could have been caused by undiagnosed infective complications.

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Of the acute-phase proteins in man C-reactive protein (CRP) rises the most dramatically, increasing up to 1 000-fold after infarction, infection, trauma and certain neoplasias.[1,2] Its short half-life (6-8 hours) sensitively reflects changes in a patient's clinical condition. Modern quantitative assays overcome most of the limitations of semiquantitative measurements and make this a useful clinical tool in diagnosis and follow-up in many diseases. With the enzyme-multiplied immunoassay technique (EMIT) CRP levels can be measured within minutes.

The value of CRP measurement has been well established in infection, but its use in pregnancy and neoplasia is contentious. Its potential in the differential diagnosis of pelvic infections and ectopic pregnancy, in the staging of carcinoma of the cervix and after necrotizing irradiation for tumour was assessed.

Patients and methods

Blood specimens for CRP assay were taken on admission from 8 patients diagnosed as having an ectopic pregnancy. In all these cases the diagnosis was confirmed during surgery. Blood specimens were also taken from 11 patients diagnosed as having acute pelvic infection according to established clinical criteria and response to antibiotic therapy.

Specimens were taken from 57 patients diagnosed as having infiltrating carcinoma of the cervix. The diagnoses were confirmed histologically and the patients staged according the International Federation of Gynaecology and Obstetrics (FIGO) classification. Patients staged as stage IIB (23 cases) and IIIb (34) were included. From these patients 10 with stage IIB and 16 with stage IIIB carcinoma of the cervix had serial CRP measurements performed twice weekly during radiotherapy.

CRP was measured by a sensitive magnetizable cellulose solid-phase immunoradiometric assay which allowed for a throughput of 50 samples an hour by a single operator.[3] Serum samples were separated within 6 hours, stored at -20°C and assayed in batches.

The Wilcoxon rank-sum test for unpaired data was used to establish the significance of differences between groups.

Results

The CRP levels in patients with pelvic infection were significantly higher (median 175 mg/l) than in those with ectopic pregnancy (median 8 mg/l) ($P < 0,02$), with minimal overlap. In contrast, there was no difference in CRP levels between patients with stage IIB and those with stage IIIB carcinoma of the cervix (median 14 and 19 mg/l) ($P > 0,05$); the majority of these patients had CRP levels below 20 mg/l. The 26 patients followed up serially during radiotherapy showed great variation in CRP levels (0 - $\geqslant$ 280 mg/l) (Table I).

TABLE I. ACUTE-PHASE RESPONSES DURING RADIOTHERAPY

Response	No.
Initial response	6
No response	10
Erratic response	6
Delayed response	4
Total	26

Discussion

The hepatic synthesis of CRP is initiated by infection or necrosis and mediated by the release of lymphokines, including macrophage interleukin 1.[1,2] However, in certain inflammatory and neoplastic conditions such as systemic lupus erythematosus, ulcerative colitis and acute leukaemia, no acute-phase response is mounted.[4] This study shows a clear difference between CRP levels in patients with ectopic pregnancy and those with acute pelvic infection. The lack of a major acute-phase response in the majority of ectopic pregnancies allows CRP measurement to assist in the differential diagnosis of patients with acute lower abdominal pain. With EMIT a rapid result can be obtained.

In carcinoma of the cervix the situation is more complex, the majority of patients not mounting a significant acute-phase

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response. The absence of a difference between stage IIB and IIIB and the wide spread of CRP levels indicate that it is unlikely that the neoplastic process causes the major elevation of CRP in certain patients, in whom concomitant infection must be suspected.

In contrast to tissue necrosis after myocardial infarction where all patients mount a major and predictable acute-phase response, the necrosis after irradiation resulted in an unpredictable and erratic response in 16 patients, 10 patients showing no response (Table I).[5] It is not possible to ascertain whether the CRP elevations which occurred after irradiation resulted from tumor necrosis or inflammatory exacerbations in necrotic tissue. Two patients in whom pelvic inflammatory exacerbation was diagnosed during radiotherapy both showed significant elevations of CRP levels which decreased on treatment.

Serum CRP levels failed to differentiate between stages IIB and IIIB carcinoma of the cervix and were subject to substantial individual variability during radiotherapy. The wide range of acute-phase responses in these patients could be due to infective complications, often undiagnosed. However, CRP levels were significantly higher in cases of pelvic infection than in ectopic pregnancy and may be of value in differentiating between these.

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Comparison of nalbuphine and pethidine for the relief of pain after caesarean section

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Summary

Nalbuphine (Nubain; Du Pont) 0,2 mg/kg (a new semisynthetic agonist-antagonist opioid) was compared with pethidine 0,75 mg/kg intravenously for analgesia after caesarean section in 70 patients. Statistical analysis of data showed that there was equivalence for analgesia, respiratory rate, cardiovascular parameters, side-effects and patient acceptance between the two drugs.

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Nalbuphine hydrochloride (Nubain; Du Pont) is a semisynthetic opioid agonist-antagonist analgesic derived from phenanthrene. It is structurally related to oxymorphone and naloxone, and its efficacy as an analgesic in moderate to severe pain has been established.[1,2] In view of the 'plateau' respiratory depression[3] nalbuphine may be preferred in postoperative pain relief. We compared the efficacy and safety of nalbuphine 0,2 mg/kg with pethidine 0,75 mg/kg in patients who had undergone caesarean section.

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Patients and methods

Seventy black patients, American Society of Anesthesiologists' rating 1 or 2, undergoing caesarean section were divided randomly into two groups to receive either nalbuphine 0,2 mg/kg or pethidine 0,75 mg/kg intravenously postoperatively. The analgesic doses — drawn up to 5 ml with sterile water and labelled with patient's name and allocation number only — were prepared by someone other than the administering doctor. Patients under the age of 18, those who had received previous analgesia and those on treatment with mono-amine oxidase inhibitors or tricyclic antidepressants were excluded. The patients gave informed consent and the protocol was approved by the Human Ethics Committee of the University of the Witwatersrand.

Pre-operatively, all patients were weighed and received oral magnesium trisilicate prophylaxis and in addition 7 received intravenous metoclopramide. The anaesthetic was standard for the unit: thiopentone 4 mg/kg and rapid intubation sequence with cricoid pressure under suxamethonium 1 mg/kg. Anaesthesia was maintained with nitrous oxide/oxygen (50%/50%) and enflurane 0,5 - 10% as an adjuvant and muscle relaxation was achieved with *n*-allylnortoxiferine 0,15 mg/kg.