SHORT REPORTS

Rotavirus neutralisation by human milk

There has been considerable publicity recently about the benefits of breast-feeding in giving protection from infection. We have investigated the effect of mother’s serum and breast milk, taken daily for five days after birth, on rotavirus infection of cells in vitro.

Materials, methods, and results

Milk and blood samples were taken by staff at Birmingham Maternity Hospital and at Marston Green Maternity Hospital, Birmingham. Milks were clarified by centrifugation, and milks and sera were heated at 56°C for 30 minutes to inactivate complement.

Human rotavirus was obtained from the faeces of children with acute diarrhoea admitted to East Birmingham Hospital. The neutralisation test was carried out as previously described.1 2 Human rotavirus infects but fails to replicate in LLC-MK2 cells and the infected cells can be detected by an indirect immunofluorescent technique. The neutralisation titre of a milk or serum was the dilution that gave a 50%, or greater, reduction of fluorescent foci compared with the control. The specific rotavirus fluorescent antibody titres of sera and milks were determined by their reaction with rabbit rotavirus infected LLC-MK2 cells3 in an indirect immunofluorescent test.

The rotavirus neutralising titres of the randomly picked mothers’ sera varied from 1/10 to 1/640 (see table). Most of the first milk samples had a neutralising titre close to that of the mother’s serum, but this fell rapidly in the puerperium so that, by the fifth day, only the two mothers with the highest serum neutralising titres had milk titres of 1/5 or greater.

All the sera and milks were tested by indirect immunofluorescence for specific reaction with rotavirus infected cells. Specific fluorescence was given by all the sera and the early milks, but the titres were always less than the rotavirus neutralising titres (see table). Four- and five-day milk samples gave no reaction, but it was not possible to test them undiluted because of non-specific fluorescence.

The milk samples that did not neutralise human rotavirus at 1/5 dilution were tested undiluted; the virus was completely inactivated. The same result was obtained with these milks and lamb rotavirus. A high-speed aqueous supernatant of undiluted pasteurised cows’ milk and an antibody-free glycoprotein prepared from cows’ milk inactivated human rotavirus completely.

Comment

We have shown by neutralisation and immunofluorescent tests that human milk in the early puerperium contains rotavirus antibodies that decline to undetectable levels by five days after birth.

Fifth-day undiluted milks inactivated human rotavirus, but it was not possible to tell whether this was due to specific antibody. As they also inactivated lamb rotavirus, however, and human rotavirus was inactivated by cows’ milk and its phenol-extracted glycoprotein, we suggest it may be due to a non-specific antiviral milk factor.3 4

Rotavirus infection in the first few days of life is frequent and largely asymptomatic, even in breast-fed babies,5 at the time when there is a large amount of specific rotavirus antibody in the milk. The fact that undiluted human or cows’ milk also inactivates human rotavirus, however, may be an important consideration in the current breast feeding discussions.

I thank Dr D A J Tyrrell and Dr K G Nicholson of the Division of Communicable Diseases, the Clinical Research Centre, Northwick Park Hospital, Harrow, for supplying antiviral glycoprotein from cows’ milk.

Dr M E Thouless is supported by a grant from the Medical Research Council.

5 Totterdell, B M, Chrystie, I L, and Banartvala, J E, Archives of Disease in Childhood, 1976, 51, 924.

(Accepted 12 July 1977)

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Response of metastatic breast cancer to combination chemotherapy according to site

Despite the clear efficacy of combination chemotherapy in producing tumour regression in some patients with metastatic breast cancer, its precise role in the overall management of this condition remains controversial. Our experience with two chemotherapy regimens leads us to believe that the major site of symptomatic disease should be the most important factor determining the choice of systemic therapy. We briefly present the evidence for this view below.

Patients, methods, and results

The two regimens were as follows: (1) vincristine 1—5—20 mg and doxorubicin (Adriamycin) 40—100 mg intravenously on days 1 and 8; prednisolone 20 mg by mouth daily on days 1 to 14 of a 28-day cycle (VDP); or (2) methotrexate 30—50 mg, 5-fluorouracil 500—1000 mg intravenously on days 1 and 8 with cyclophosphamide 100 mg and prednis-

Milk and rotavirus antibodies

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NT = Neutralisation test. The number is the reciprocal of the serum dilution causing 50% reduction in the fluorescent foci compared with the control.

FA = Fluorescent antibody. The number is the reciprocal of the greatest serum dilution showing fluorescence with rotavirus infected cells.

*This sample was very watery.
Discussion

This wide variation in objective response in different sites is consistent with the experience of others using similar regimens, but has perhaps been inadequately emphasised. While chemotherapy may improve marrow infiltration dramatically and sometimes provide transient pain relief, we seldom see sustained objective responses in bone. This cannot be wholly due to the relatively insensitive methods for assessing the response in bone because the same techniques will detect rapid bone healing after successful endocrine treatment. Possibly such treatment has an anti-osteolytic property which chemotherapy lacks. Moreover, responses to chemotherapy tend to be shorter than those to endocrine treatment so a good endocrine response will be preferable to a good chemotherapy response. Clearly, chemotherapy has a major part to play in the management of metastatic breast cancer and we would agree with Priestman et al that this part may have been underrated. Nevertheless, we think that overall assessment of response to any treatment in a heterogeneous group of patients may be very misleading and that whenever systemic treatment is selected for a particular patient the predominant site of symptomatic disease should be a major consideration.


(Accepted 29 July 1977)

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Meningeal reaction to starch powder in the cerebrospinal fluid

There have been many reports of surgical glove powder causing granuloma formation in various tissues of the body, most notably peritoneum, but not of reaction to starch after neurosurgical operation. We report what is apparently a meningeal reaction to surgical glove powder in the cerebrospinal fluid.

Case report

A previously fit 53-year-old bricklayer developed ataxia and vertigo over eight months. EM1 scan showed a large 4th ventricle lesion that was removed at craniectomy in 1977. Histology disclosed a subependymoma. Post-operatively he was treated with betamethasone, initially 6 mg three times a day and then in decreasing doses over the next two weeks. His symptoms improved, and at 13 days he was transferred back to his original hospital for further convalescence before going home. After transfer he developed a pyrexia of 38 °C associated with general malaise and neck stiffness. A lumbar puncture 14 days after operation disclosed a large number of cells, many of which could not be identified as polymorphs or lymphocytes. He was returned to our care 15 days after operation.

Starch granules cuffed by inflammatory cells under polarised light showing birefringence. (Stained with haematoxylin and eosin and shown at a magnification of ×656.)

On return he was pyrexial (38·5 °C), with neck stiffness. The white cell count was 11·1·10^9/l (11·100/mm^3). A further lumbar puncture was performed, which produced bright yellow fluid at a pressure of 180 mm cerebrospinal fluid (CSF) with free rise and fall and the following composition—white cell count 150·10^3 /l (150/mm^3) (80% polymorphs, 20% mononuclears), red cell count 30·10^6 /l (30/mm^3), protein 1·7 g, and sugar 1·0 mmol/l. A spun deposit of CSF showed polymorphonuclear leucocytes and many large phagocytes. Throughout the film were rounded bodies that stained positively with iodine and periodic acid Schiff and showed malasse-cros birefringence under polarised light. These reactions are typical of starch granules. Almost all these bodies were surrounded by cells. No bacteria were seen, and culture was negative. A presumed diagnosis of stanch meningitis was made, and he was again treated with betamethasone. A further lumbar puncture was performed five days later, removing 30 ml of CSF in an attempt to dilute the starch concentration. This showed a similar picture, but with less starch and a higher percentage of phagocytes. The pyrexia and neck stiffness settled over five days, and he was discharged after a further five days.

Comment

We think that this is a genuine meningeal reaction to starch. In both CSF specimens examined at this hospital almost every starch granule was surrounded by a collar of inflammatory cells, and occasional macrophages with large cytoplasmic vacuoles, suggestive of absorption of starch granules, were present. This unusual appearance may explain the initial difficulty in identifying some mononuclear cells. Although no starch granulomata were seen, these observations make it unlikely that the appearances were due to simple contamin-