T-cell lymphoma of the thyroid

Surface marker studies on lymphocytes have shown that many non-Hodgkin's lymphomas, especially the nodular variety, are of B-cell type, while only a small proportion—mainly those occurring in young people—are of T-cell type.^{1,2} We believe that this is the first account of a primary T-cell lymphoma of the thyroid.

Case report

A 73-year-old woman was referred to hospital with a two-month history of a painless swelling in the neck. She was clinically euthyroid and had a nodular non-tender swelling in the left lobe of the thyroid. The results of antithyroglobulin tanned red cell and antimicrosomal fluorescent antibody tests were negative. A full blood count was normal. Surgical exploration showed that the left lobe of the thyroid was replaced by a fleshy mass, but the isthmus, right lobe, and adjacent cervical lymph nodes appeared normal. After examination of a frozen section the left lobe of the thyroid was removed. The specimen, which was received unfixed, measured 8.0 × 7.0 × 4.5 cm. It had a slightly nodular outer surface and a uniform white cut surface. Sections showed almost complete replacement of the thyroid parenchyma by a malignant lymphoma with a varied appearance. In places, the cells had slightly irregular nuclei a little larger than mature lymphocytes, but elsewhere the cells had larger nuclei which were often irregular showing numerous mitotic figures and surrounded by a moderate amount of pyroninophilic cytoplasm. A few non-neoplastic histiocytes with abundant pink cytoplasm were also present.

Lymphocyte surface marker studies were carried out on a cell suspension prepared from the fresh surgical specimen.³ 99% of the viable tumour cells (80% viability) formed E-rosettes with sheep red blood cells, while only 1% showed surface immunoglobulin. A rosette cell pellet was also processed for electron microscopy (see figure). Postoperative radiotherapy was given to the thyroid region, and the patient is alive and free from evidence of disease two years after operation.

Lymphoid cell with an irregular nucleus surrounded by sheep red cells. (×10 890.)

Comment

Primary lymphomas of the thyroid are uncommon and may be difficult to distinguish from anaplastic small cell carcinoma.⁴ In this case, the histological and electron microscopical appearance of the tumour cells indicated a lymphoid rather than an epithelial neoplasm. The absence of any sign of disease two years after operation is also more in keeping with lymphoma than anaplastic carcinoma.⁴ Difficulty may also arise in distinguishing the lymphoid infiltrate in Hashimoto's thyroiditis from lymphoma. In this case there was no serological

evidence of thyroiditis and the appearance of the infiltrating cells left no doubt that they were malignant. Most of the viable tumour cells formed E-rosettes, indicating a lymphoma of T-cell type.^{1,5}

While a few T-cell lymphomas have been reported in adults, most have been found in young people in whom a mediastinal mass has often been present and who have tended to develop a leukaemic blood picture.² Our patient is older and had a normal blood picture. We are not aware of any other reports of lymphocyte surface marker studies on primary lymphomas of the thyroid. It will be of interest to see whether the cells of other thyroid lymphomas are of T-cell, B-cell, or histiocytic origin, or are receptor-silent and of "null" type.

We thank Dr R A G Brown for the histology report and Mr R F Fawkes for the electronmicrograph.

Requests for reprints should be addressed to: Dr J B MacGillivray, Department of Pathology, Ninewells Hospital, Dundee DD2 1UB.

¹ Bloomfield, C D, *et al*, *Lancet*, 1976, 2, 1330.

² Nathwani, B N, Kim, H, and Rappaport, H, *Cancer*, 1976, 38, 964.

³ Dunbar, J A, *Lancet*, 1975, 1, 222.

⁴ Smithers, D W, *Tumours of the Thyroid Gland*. Edinburgh, Livingstone, 1970.

⁵ Peter, C R, MacKenzie, M R, and Glassy, F J, *Lancet*, 1974, 2, 686.

(Accepted 3 May 1977)

Departments of Pathology and Surgery, Ninewells Hospital, Dundee DD2 1UB

J A DUNBAR, MB, MRCP, general practitioner (formerly registrar in pathology)

M H LYALL, CHM, FRCS, consultant surgeon

J B MacGILLIVRAY, MB, FRCPATH, consultant pathologist

R C POTTS, FILMS, senior technician

Neonatal hyperbilirubinaemia: a comparison between prostaglandin E₂ and oxytocin inductions

The use of oxytocin in the induction of labour has been implicated as a cause of neonatal hyperbilirubinaemia.¹ Neonatal hyperbilirubinaemia, however, does not seem to result from induction with prostaglandin E₂ (PGE₂),² though some studies³ suggest differently. The present study compares the incidence of neonatal hyperbilirubinaemia in patients who are induced with oxytocin with the incidence in those who are induced with PGE₂.

Patients, methods, and results

One hundred and thirty-five patients and their infants were studied prospectively. They were separated into three groups. Group A consisted of patients who were induced by low amniotomy followed by PGE₂ by mouth. The dosage of PGE₂ was adjusted to the patients' response. Initially 0.5 mg was given and was repeated at hourly intervals. If the uterine activity was inadequate 1 mg (two tablets) was given hourly until uterine contractions were established. Group B consisted of patients induced by simultaneous low amniotomy and intravenous oxytocin infusion regulated with a Tekmar pump. Group C consisted of patients whose labour started spontaneously with no prostaglandins or oxytocin.

Cord blood was obtained after delivery and the infant's blood was collected by heel prick on the third and sixth postnatal days. Total serum bilirubin levels were estimated by a spectrophotometric method within 24 hours. Some infants were excluded from the trial for the following reasons: (1) low birth weight (under 2500 g), (2) haemolytic disease, (3) infection, (4) instrumental delivery or caesarean section, (5) gestation of under 37 weeks, and (6) discharge from hospital after 48 hours.

The mean (±SD) serum bilirubin levels of the infants in each group at the first, third, and sixth days are shown in the table. Statistical analysis, using a two-sample *t* test, showed that the mean serum bilirubin concentrations of infants delivered after induction with oxytocin (group B) were significantly higher ($P < 0.01$) on each of the three days compared with those of infants delivered after spontaneous labours (group C). A comparison of the neonatal bilirubin levels after labours induced by PGE₂ (group A) and spontaneous labours (group C) showed no significant difference ($P > 0.05$). Taking a serum bilirubin level of less than 205 μmol/l (12 mg/100 ml) as within normal limits in the neonatal period, two out of 45 infants (4%) in group A, six out of 45

Mean ($\pm$ SD) total serum bilirubin concentrations ($\mu\text{mol/l}$) in each of three groups of infants

	Group A (n = 45)	Group B (n = 45)	Group C (n = 45)
First day	38.8 $\pm$ 7.0	45.3 $\pm$ 10.2	39.0 $\pm$ 9.5
Third day	94.3 $\pm$ 32.1	145.6 $\pm$ 47.0	94.0 $\pm$ 32.6
Sixth day	84.6 $\pm$ 31.5	129.7 $\pm$ 48.5	81.2 $\pm$ 32.6

Conversion: SI to traditional units—Bilirubin: 1 $\mu\text{mol/l} \approx 0.1 \text{ mg/100 ml}$.

(13%) in group B, and one out of 45 in group C (2%) had serum bilirubin levels of more than 205 $\mu\text{mol/l}$.

Comment

An association between oxytocin induction and neonatal hyperbilirubinaemia is further confirmed in this series. Notably, induction with PGE_2 does not seem to carry this risk. This accords with the results of Beazley and Weekes,² who induced labours with intravenous PGE_2 in a large series. This distinction is further borne out by the fact that serum bilirubin levels were more than 205 $\mu\text{mol/l}$ in only two out of the 45 infants in the prostaglandins group whereas this clinically significant level of serum bilirubin was present in six of the oxytocin group.

The role of prostaglandins in inducing the fetal hepatic enzymes has not been investigated. In the light of the results of the present series one hypothesis emerges. In acutely hypophysectomised rats prostaglandins increase corticosterone synthesis and release⁴ and PGE_2 has been shown to increase synthesis of cortisol in minced beef adrenals.⁵ These in-vitro studies imply that prostaglandins have a direct role in steroidogenesis. By promoting steroidogenesis prostaglandins might well help to prime the fetal hepatic enzyme systems, some of which are known to be corticosteroid inducible. This concept needs to be investigated further, especially because of increasing evidence that prostaglandins play a significant part in initiating spontaneous labour.

I thank the obstetric and paediatric consultants for permission to carry out this study, and Dr S J Pocock, of the Medical Computing and Statistics Group, for his statistical analyses.

¹ Chew, W C, and Swann, I L, *British Medical Journal*, 1977, 1, 72.

² Beazley, J M, and Weekes, A R L, *British Journal of Obstetrics and Gynaecology*, 1976, 83, 62.

³ Calder, A A, et al, *Lancet*, 1974, 2, 1339.

⁴ Flack, J D, and Ramwell, P W, *Endocrinology*, 1972, 90, 371.

⁵ Saruta, T, and Kaplan, N M, *Clinical Research*, 1971, 19, 69.

(Accepted 14 April 1977)

Elsie Inglis Memorial Maternity Hospital, Edinburgh

W C CHEW, FRCS, MRCOG, registrar in obstetrics (now consultant obstetrician, Queen Elizabeth Hospital, Kota Kinabalu, Sabah, Malaysia)

Forrester laryngeal sprays as a source of pseudomonas respiratory tract infection

Although contaminated respiratory apparatus is well recognised as a cause of common-source outbreaks of infection with *Pseudomonas aeruginosa*,¹⁻⁵ it is important to draw attention to any item of equipment that has been overlooked as a potential source. This report describes the unsuspected widespread contamination of Forrester laryngeal lignocaine sprays, one of which caused an outbreak of respiratory tract infection with *Ps aeruginosa*.

These sprays, used routinely by anaesthetists, consist essentially of a slightly curved metal laryngeal tube connected by rubber tubing to a transparent polycarbonate chamber containing lignocaine (figure). When the rubber hand bulb is squeezed, lignocaine passes from the chamber, via a smaller internal rubber tube, to the tip of the instru-

A Forrester lignocaine spray.

ment and is liberated as an aerosol. There is a need for simple modification of these instruments so that more complete bacterial decontamination may be achieved routinely.

The Outbreak

Between 14 and 18 April 1975 six women, in good general health, underwent general anaesthesia for gynaecological operations in the same theatre. Postoperatively they all unexpectedly developed clinical evidence of respiratory tract infection characterised by a productive cough with purulent sputum and, in some instances, sustained fever. Pulmonary consolidation was not apparent. Examination of sputum samples taken from each patient within 48 h of operation confirmed the presence of pus cells, and all specimens yielded *Ps aeruginosa* pyocine type 10a, serotype 11, usually in moderate to heavy amounts. All patients recovered with physiotherapy without antibiotic treatment.

Bacteriological examination of the operating theatre failed to demonstrate contamination of the anaesthetic machine, catheter mounts, inspiratory or expiratory tubing, lubricating jelly, or 4% lignocaine stock bottle. Nevertheless, a Forrester laryngeal lignocaine spray, used for all the infected patients at the time of operation, was found to be contaminated with *Ps aeruginosa* pyocine type 10a, serotype 11 (approximately 10^{3-4} organisms/ml of 2.5-ml washings). Examinations of the records of sterility control for preparations autoclaved in the hospital pharmacy showed no past failures for 4% lignocaine. Thus the Forrester spray itself was considered to be the common source for this outbreak.

Seven out of seven Forrester, and similarly designed Macintosh, sprays in current use in seven other theatres at another hospital in the same district yielded moderate numbers of various *Pseudomonas* spp, including *Ps aeruginosa* and *Ps cepacia*. There was, however, no laboratory evidence of post-operative chest infections in patients who had recently had operations in these theatres.

Decontamination and modification of Forrester sprays

In the past little attention has been paid to defining a precise procedure for cleaning these sprays. Occasionally they may be autoclaved, but repeated autoclaving ultimately damages the rubber tubing, the hand-bulb, and the polycarbonate lignocaine container.

We have modified the sprays by employing, where possible, autoclavable materials. The wider outer tubing connecting the lignocaine chamber to the metal laryngeal tube may be replaced by 4.8 mm (3/16 in) internal diameter $\times$ 7.9 mm (5/16 in) outer diameter Silastic (Lepetit Pharmaceuticals Ltd) autoclavable rubber tubing. The narrower inner tubing, passing from the lignocaine chamber to the tip of the spray, can be replaced by 1.57 mm (0.062 in) id $\times$ 2.41 mm (0.095 in) od Silastic tubing. The lignocaine chamber also needs to be refashioned in an autoclavable transparent material such as Pyrex glass, but this may be difficult to arrange as these sprays are manufactured abroad. Meanwhile the existing chamber should be removed and cleaned with alcoholic chlorhexidine (0.5%) and stored dry.

Forrester sprays, modified in this way, may be repeatedly autoclaved without damage, provided that the polycarbonate chamber and rubber hand-bulb are removed first. We were unable to detect altera-