Prognosis

The prognosis in hydatid disease depends upon the presence or otherwise of complicated cysts. In this series of 34 patients treated surgically there were four deaths, an operative mortality of 11.8%. Three patients died from complications of the cyst and one from post-operative haemorrhage. All four patients were 60 years of age or over; there were no deaths at any age in patients with uncomplicated cysts.

The lower mortality and morbidity rates in the post-war era can largely be attributed to the use of antibiotics, both prophylactically and in the control of infection. Antibiotic therapy has certainly lessened the incidence and spread of infection. In the present series there were no instances of subphrenic suppuration, and post-operative chest complications were rare.

Furthermore, improved methods of anaesthesia have made possible a more complete surgical ablation of the disease. This is reflected in the low recurrence rate; so far in this series, cysts have recurred in only two patients.

Summary

A survey is made of 44 cases of hydatid disease treated in hospitals serving North Wales from 1948 to 1957.

Some epidemiological aspects of the disease are described. Attention is drawn to the difficulty of effective supervision of slaughterhouses in some areas.

Hydatid disease is an eradicable disease with a significant mortality rate. Though the incidence in Wales is low compared with many other sheep-rearing countries, it remains higher than in other parts of the United Kingdom.

The clinical features of the various types of cysts seen in this series are discussed. The latency of the disease, particularly in the liver, is stressed. Symptoms are usually the result of complications occurring in the cyst.

The diagnostic criteria are described. Radiological evidence of calcification was observed in a high proportion of liver and splenic cysts.

Details of surgical treatment varied according to the site of the cyst and the complications present, but all methods aimed at a complete removal of the parasitic membranes.

The operative mortality was confined to patients aged 60 or more suffering from complicated multivesicular cysts.

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INFLUENCE OF THYROXINE ON THE INCIDENCE OF HARELIP IN THE "STRONG A" LINE OF MICE

BY

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The incidence of congenital malformations produced in the laboratory animal both by hypervitaminosis-A and by x-irradiation may be modified by the use of hormones and hormone antagonists. Cortisone augments the teratogenic activity of both vitamin A (Millen and Woollam, 1957; Woollam and Millen, 1957), and x-radiation (Woollam, Millen, and Fozzard, 1959). Methylthiouracil also increases the teratogenic action of vitamin A (Woollam and Millen, 1958), whereas insulin (Millen and Woollam, 1958a), thyroxine (Millen and Woollam, 1959), and vitamins of the B group (Millen and Woollam, 1958b) afford protection against this activity of the vitamin. Attempts have also been made to elucidate whether the modifying action of vitamins, hormones, and hormone antagonists extended to those deformities which were genetically determined rather than produced by a teratogenic agent. This paper records the findings of one such series of experiments.

Present Experiments

Methods.—Female mice of the Strong A line were used in these experiments. Only brother-sister matings were employed throughout, and the onset of pregnancy was determined by the presence of a vaginal plug, the day on which the plug was detected being taken as Day 1 of the pregnancy. The animals were divided into two groups. Animals in group 1, the control group, received no treatment. Each animal in group 2 received 0.1 mg. of thyroxine by subcutaneous injection on both Day 11 and Day 12 of pregnancy. On Day 18 all the animals were killed. The young were removed from the uterus and examined for the presence of harelip.

Findings.—The incidence of harelip in the two groups is shown in the Table. Statistical analysis of the results of these experiments indicates a highly significant

Incidence of Harelip

Group	A No. of Litters	B No. of Litters with at Least One Foetus with Harelip	C Total No. of Young	D Total No. of Young with Harelip
1. Control	28	17	207	25 (12.1%)
2. Thyroxine 0.1 mg. on days 11 and 12 of pregnancy	19	5	138	6 (4.4%)

Statistical analysis:
 Comparison based on columns C and D, $\chi^2 = 6.05$ on 1 d.f.
 " " " " " A " B, $\chi^2 = 5.36$ "

difference in incidence between the two groups, and justifies the conclusion that the administration of thyroxine to the pregnant dam has the effect of reducing the incidence of harelip in the Strong A line of mice.

Discussion

The genetics of harelip in the mouse have not as yet been satisfactorily elucidated. The most significant theoretical concept is that of Grüneberg (1943), who suggested that the Strong A line may be homozygous for a harelip gene, or more probably a small number of cumulative genes, with a series of minus modifiers exerting a protective action and, in most cases, cancelling out the effect of the gene or genes. That such modification might be due to environmental factors was the opinion of Reed (1936), who attributed the variation in incidence of harelip in the house mouse to the interplay of environmental and genetic effects, the environmental factors being five times as influential as the genetic.

The influence of maternal factors on the incidence of harelip in mice was shown by Steiniger (1939), who was able to increase the incidence of harelip in a susceptible strain by the administration to the dam of "preloban," a preparation which contains all the known anterior pituitary hormones, during the first half of pregnancy. Since anterior pituitary hormones increase, and thyroxine decreases, the influence of the gene or genes for harelip, it would seem that the hormonal balance of the mother is of considerable significance for the proper development of the lip in the foetal mouse. Unfortunately the part played by the maternal organs and placenta in the endocrine control of the foetus is as yet only imperfectly understood, but such information as is available suggests that, at the critical period of development of the lip, the foetal mouse is entirely dependent for thyroxine and insulin upon the endocrine system of the mother. Therefore, though it is not possible to detect the precise mechanism by which thyroxine exerts its protective action against the deleterious effects of the harelip gene or genes, it is clear that, if it acts by influencing the production of hormones by the thyroid gland or islets of Langerhans, it must do so by influencing these structures in the mother rather than in the foetus. If, on the other hand, the activity of the thyroxine is directly on the developing foetal tissues, it may be that it exerts its protective effects by an influence on the carbohydrate metabolism of the cell.

It is interesting to note that Eggenberger (1928) observed that many congenital malformations are more common in cretins than in the population at large. There are a number of congenital conditions, of which cretinism is but one example, in the production of which the interplay of genetic and environmental factors appears to be involved. It may be that in the elucidation of the aetiology of these conditions, which can be explained only partially on a genetic basis, attention should be paid to what is perhaps the most significant environmental factor to which the developing foetus is exposed, the influence of the endocrine system of its mother.

Summary

A significant decrease in the incidence of harelip in the Strong A line of mice was produced by administering 0.1 mg. of thyroxine to the dam on the 11th and 12th day of pregnancy.

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THE POLYMASK AS A MEANS OF ADMINISTERING OXYGEN

BY

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The polymask is often used to administer oxygen to patients, and in the General Infirmary at Leeds (1,000 beds) 2,160 polymasks were used last year on medical and surgical cases.

The polymask is a bag made of soft "polythene" sheeting, with an inner smaller bag at the top. Oxygen is fed into the larger bag through a narrow plastic tube, then into the smaller compartment through two holes, each $\frac{1}{4}$ in. (12.5 mm.) in diameter. Two smaller holes, piercing both the inner compartment and the outer bag and situated near the patient's nostrils, are designed for the emergence of carbon dioxide. A bare wire runs round half the top of the bag and is moulded over the patient's nose and cheeks; the portion of the bag beneath the chin is quite loose and no attempt at close fitting is made. Thread elastic passes round the head and fixes the bag in position.

The polymask has been tested for the accumulation of carbon dioxide, and this was found not to occur to any significant degree (Ogilvie, 1956). However, its efficacy as a means of delivering oxygen to the wearer was in doubt after observing it in use. It seemed that one or both of two occurrences could be responsible for the patient's inspiring room air through the holes designed for expiration even when the oxygen was entering the mask at 8 litres a minute.

Firstly, owing to the lightness and softness of a bag which is of relatively large dimensions (8 by 8 in.—20 by 20 cm.) and the presence at its base of a tube of extremely narrow bore to which is attached, through a tapered connexion, a much heavier connecting tube from the oxygen cylinder, kinking of the bag above the entry tube can occur, with the production of deep creases in it (Fig. 1). This usually causes the second occurrence, which is that the two holes into the inner compartment either collapse on themselves or get so displaced that they come to lie beneath the chin, with

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