Summary

An epidemic of nephritis associated with *Streptococcus pyogenes* type 12 occurred in York and in predominantly rural areas of the North Riding during the winter months of 1957 and 1958. In several schools in which there was evidence of type 12 infection in 1957 some children were also found with symptomless haematuria. Spread of infection took place in schools and at home. Symptoms of the initial streptococcal infection were usually present but often slight, and were followed by the onset of nephritis 7 to 24 days later.

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REFERENCE

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AN OUTBREAK OF NEPHRITIS IN NORTHAMPTONSHIRE

BY

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In April, 1957, the head teacher of a village school telephoned the county health department to say that three children in the upper junior class at his school had fallen ill with nephritis within a period of a month. A fourth child, in the lower junior class, had been taken by his parents to Portsmouth, where he had become ill; the doctor had diagnosed pyelitis and sent the family home. Another child in the village attending a different school was under observation by the family practitioner with a sore throat and puffiness under the eyes. As a result of this outbreak there was considerable anxiety amongst the parents in the village; some of the children were being kept away from school unnecessarily, others were returning to school in an unfit condition. Although there had been a considerable amount of upper respiratory infection in the infant and lower junior classes in the early months of the year, it was not until April that the upper junior class had been affected, and it was in this month that nephritis had suddenly arisen as a complication.

Investigation

The school, which was visited on the same day, was soundly constructed and the rooms were well ventilated and

FIG. 1.—Nephritis in Northamptonshire. Incidence of 89 cases by month of onset, May, 1955, to May, 1958.

not overcrowded. All the children and staff were examined, and swabs were taken from any lesions suggestive of streptococcal infection. Group A type 12 haemolytic streptococci were obtained from lesions in two children in the upper junior class in which the cases of nephritis had occurred. One of the two children had a sore throat, the other a sore place in the nostril. The desks occupied by these two children and the children with nephritis were not grouped, but were dispersed among other desks in the classroom.

Apart from reassurance and advice to the head teacher it seemed desirable to assess the size of the outbreak. From discussions with practitioners it was evident that other cases had occurred in near-by villages, and from the paediatric department it was learned that about 25 children from the county had been admitted to hospital with nephritis since the previous October. In order to obtain further information Dr. C. M. Smith, the County Medical Officer of Health, wrote to all doctors practising in the county giving them particulars of the outbreak and asking to be notified of any cases under their care. From the replies received it is possible to present the following information.

Epidemiological Distribution

Only four cases were ascertained in 1955 (Fig. 1). Then in the first quarter of 1956 five children living in Kettering were taken ill; three of them lived in the same neighbourhood—two in houses almost opposite each other. Two months later cases were reported from Wellingborough, where the infection continued until June of the following year. By March and April, 1957, the infection had spread south-west to Northampton County Borough and had reached considerable proportions, the incidence in the county town being reflected in several small outbreaks in the outlying village communities, such as that already described. The infection then appeared to continue south-west, and by the late autumn it looked as though it was dying out. Over the winter months, however, another, and smaller, outbreak occurred, which was centred round Northampton, and again cases occurred in outlying villages and towns which had not been affected in the first outbreak.

It would be unwise to draw conclusions from data which are probably incomplete. Nevertheless, from the cases ascertained it can be said that there was no similarity between the distribution of cases of scarlet fever and nephritis during the period under review. Many of the scarlet-fever notifications were sporadic "dropping" cases, so that inevitably there were occasions when both conditions occurred in the same area at the same time. Beyond this, however, there was no evidence of association in the spread of the two infections.

Age and Sex Incidence.—In all, 89 cases were ascertained. Seventy-three occurred in children, 52% of whom were boys. One child under 3 was affected; 12 cases occurred in children aged 3 and 4 years; 45 cases in children aged 5 to 9 years; 15 cases in children aged 10 to 15 years (Fig. 2); and 16 cases in persons aged 15 years.

FIG. 2.—Nephritis in Northamptonshire. Age distribution of 73 cases in children.

Clinical Picture

Most of the patients were children and were admitted initially to hospital. Parents gave a history of febrile illness two weeks previously, invariably with a sore throat or other obvious upper respiratory infection. Frequently oral penicillin had been given by the general practitioner. There then followed a period of apparent recovery until perhaps the day before admission, when the child again became unwell, with loss of appetite, lassitude, pallor and puffiness of the face, and, on occasion, headache. In some cases the parents had observed the passing of dark urine. On examination the urine was found to be loaded with albumin and gave a positive chemical test for blood, which was confirmed by microscopy.

Two weeks after the initial infection positive nose or throat swabs were obtained in a high percentage of children; in all others the anti-streptolysin titre was raised. The organism found was invariably the haemolytic streptococcus (Lancefield group A type 12). Approximately 60% had raised blood pressures, and in two cases this was high enough to produce hypertensive encephalopathy. One of these patients presented in the casualty department as a case of sudden blindness.

On admission to hospital the lingering presence of the streptococcus was always assumed and every patient received a 14-day course of intramuscular penicillin. Cases of hypertension were sedated and every patient was confined strictly to bed until the Addis count (a measure of microscopic haematuria) approached normal. When the number of red blood cells in an overnight 12-hour specimen of urine was down to 1,000,000, gradual mobilization of the patient began. He was allowed home when the red cells were less than 500,000. The average length of bed rest required was 15 weeks, though some cases took as long as 20 weeks to produce a normal Addis count. Hypertension rapidly disappeared, usually within 10 days. Several cases had grossly enlarged, pitted, and unhealthy tonsils, and one child had an infected aural polyp. These cases showed slow response to medical treatment, but when surgery was carried out the subsequent improvement was impressive.

After discharge from hospital all cases were followed up. Earlier cases showed an increase in the Addis count associated with comparatively mild upper respiratory infections. Many showed increased counts even without obvious infection. Later patients were sent home on small prophylactic doses of phenoxymethylpenicillin daily, and these have so far shown a remarkable improvement in the follow-up condition. It is too early yet to assess the long-term effects of the disease and the treatment, but from preliminary observations it would seem that there is unlikely to be any gross permanent renal damage.

Discussion

In the present outbreak the exchange of information between the health department and medical practitioners was probably of value. The experience obtained suggests that in future outbreaks of serious infections which are not notifiable it would be a useful measure to alert all practitioners as soon as possible, since early treatment may help in modifying the severity of the attack or preventing complications.

In view of the complications likely to arise from streptococcal reinfection, it is worth while considering whether schoolchildren should not receive special supervision after an attack of nephritis. Teachers could be advised that they should report at once to the principal school medical officer in the event of upper respiratory or cutaneous infections in the class or school. Any child at special risk of nephritis reinfection could then be temporarily excluded. It would seem advisable also that parents should be cautioned of the liability of reinfection, so that crowded gatherings were avoided until the child's resistance was considered satisfactory.

Summary

A description is given of an outbreak of nephritis in Northamptonshire due to group A type 12 haemolytic streptococci. In all, 89 cases were ascertained; 73 occurred in children under 16 years of age, 52% of whom were boys.

Many of the cases were notified by practitioners in response to a circular letter which notified them of the outbreak and asked for particulars regarding cases in their practice. Early exchange of such information would appear to be a useful measure in serious infections that are not notifiable.

No association was noted between the distribution of nephritis and scarlet-fever cases during the period under review.

The cases showed the familiar pattern of acute nephritis, though the severity varied greatly from patient to patient. Albuminuria and transient "frank haematuria" were constant features. Following initial penicillin (intramuscular), prolonged bed rest was the most important part of the treatment, its duration being dictated by weekly microscopy of the urine and E.S.R. estimation.

The importance of keeping post-nephritis free of further streptococcal infection is emphasized. In this respect the oral administration of phenoxymethylpenicillin is a safe and efficient method of prophylaxis. In addition it may be considered desirable to advise parents regarding the risk of reinfection, and for the children to receive special supervision at school.

We thank Dr. C. M. Smith, County Medical Officer of Health for Northamptonshire, for his advice; Dr. I. H. Gosset, consultant paediatrician, for permission to refer to cases under his care; and all medical practitioners in the county, without whose co-operation the outbreak could not have been investigated.

POSSIBLE DISADVANTAGES OF A CHEST RADIOGRAPHY SERVICE FOR GENERAL PRACTITIONERS

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It is common practice in many chest clinics to provide, in addition to normal consultations, special sessions to which practitioners may refer their patients for chest radiography only. These patients form a selected group in that they are usually referred because of symptoms which could arise from respiratory disease. If a chest radiograph shows an abnormality it is mutually understood by practitioner and physician that the patient may be recalled to the clinic for further investigation.

The diagnostic value of this service is demonstrated by the regularly high yield of abnormalities; its possible disadvantages are seldom even discussed. Disease not obvious on the chest film might be found by clinical examination. Moreover, a normal x-ray report from the clinic might allay practitioners' fears and, by false reassurance, delay diagnosis.