EPILEPSY IN SCHOOL CHILDREN

By

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In a previous communication it was suggested that about 0.3 per 1,000 children should be in special schools for epileptics (Henderson, 1948). Since, however, many factors have to be considered before a child is recommended for a boarding special school, it was decided to examine all the children in certain representative areas who were known by the School Medical Officers to be epileptic and educable, in order to find out how many were in need of treatment and education in special schools and what effects epilepsy had on children living in the community.

The investigation was made in Carlisle, Bolton, York, Derby, Cambridge, Ipswich, Norwich, Bedford, Luton, Norfolk, East and West Suffolk, Cambridgeshire, Isle of Ely, Huntingdonshire, Bedfordshire and part of the Metropolitan area (about one-third of Middlesex and West Ham). These areas had a school population of 355,000, being about 6 per cent. of the school population of England and Wales. Time did not permit a wider enquiry.

Children were seen in their own homes, at school clinics, or in their schools. At least one parent was always interviewed. The school medical and educational records of every child were examined, and were discussed with the school doctors and, often, with the teachers. Each child was given an intelligence test (Revised Terman-Merril—Forms L or M) and a detailed history was recorded from the parents.

INCIDENCE

Altogether 430 educable children (1·2 per 1,000) were found to be epileptic (Table I). The incidence was 1·1 per 1,000 in the metropolitan and rural areas and 1·5 per 1,000 in the towns.

Of the 430 children, 316 had major, 65 had minor, and 49 had both types of seizures; 250 were boys and 180 were girls. Of these children 365 were examined; 49 of the remaining 65 were in boarding special schools for epileptic children and the other sixteen were not seen either because they were ill or because their parents refused to allow them to be examined. Only about half a dozen parents were unwilling to take part in this investigation.

<table>
<thead>
<tr>
<th>Area</th>
<th>School Population</th>
<th>Epileptic Children</th>
<th>Incidence per 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern towns</td>
<td>64,000</td>
<td>94</td>
<td>1·5</td>
</tr>
<tr>
<td>Towns in East Anglia and in some Home Counties</td>
<td>58,000</td>
<td>85</td>
<td>1·5</td>
</tr>
<tr>
<td>Metropolitan area (Parts of Middlesex and West Ham)</td>
<td>110,000</td>
<td>118</td>
<td>1·1</td>
</tr>
<tr>
<td>Rural areas (East Anglia and some Home Counties)</td>
<td>123,000</td>
<td>133</td>
<td>1·1</td>
</tr>
<tr>
<td>Totals</td>
<td>355,000</td>
<td>430</td>
<td>1·2</td>
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</tbody>
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FREQUENCY OF SEIZURES

The frequency of fits among the 365 children examined was as follows:

- daily, 26 (six with grand mal);
- weekly, 32 (24 with grand mal);
- monthly, 39 (29 with grand mal);
- less frequently than once a month, 268 (of whom 193 had fits at intervals of more than 6 months).

A total of 29 children (ten with grand mal) had fits on the day of examination, and 46 (33 with grand mal) had them in the previous week. But on the other hand, 139 (38 per cent.) had not had a fit for more than one year, and fifty (14 per cent.) had been free from fits for more than 3 years. Only 34 (9 per cent.) of the 365 children gave a history of fits in school.

It was difficult to assess the severity of the seizures from the descriptions given by parents; the period of unconsciousness was frequently confused with the deep sleep that often followed a major attack. But it was evident that a number of the children, including some who had few or infrequent fits, had experienced very severe seizures. Eight had been sent to hospital in status epilepticus; six of these had been fit-free for at least one year before the visit, and the other two were still having attacks at least once a week.

INTELLIGENCE

Of the 365 children, 59 per cent. were of average intelligence, 31 per cent. were below, and only
10 per cent. were above the average at the time of the examination (see Table II).

**TABLE II**

<table>
<thead>
<tr>
<th>I.Q.</th>
<th>Number</th>
<th>Per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 70</td>
<td>54</td>
<td>15</td>
</tr>
<tr>
<td>70-84</td>
<td>60</td>
<td>16</td>
</tr>
<tr>
<td>85-114</td>
<td>215</td>
<td>59</td>
</tr>
<tr>
<td>115+</td>
<td>36</td>
<td>10</td>
</tr>
</tbody>
</table>

| Total    | 365    | 100       |

Severe and frequent fits and the taking of drugs for several years are almost bound to have some effect on the personality of an epileptic child; unless one can observe such a child from the onset of the seizures, and over a long period, it is impossible to assess the full effect of these influences.

It was found that 188 (66 per cent.) of those with major, and 63 (78 per cent.) of those with minor epilepsy had an I.Q. of 85 or more (Table III). Of the 97 children who had fits at least once a month 41 (42 per cent.) had an I.Q. below 85, compared with 73 (27 per cent.) of 268 children with an I.Q. below 85 who had seizures at longer than monthly intervals.

The medical superintendents of the special schools attended by the 49 children who were not seen, kindly gave the results of intelligence tests performed in the schools: 28 (57 per cent.) had an I.Q. of less than 85, and only three (6 per cent.) one of 85 or more. If these 49 children had been added to the 365 examined, the number with an I.Q. below 85 would then have been increased from 114 (31 per cent.) to 142 (34 per cent.). It has to be remembered that no account was taken of children also known to be ineducable in the sample population; but the general opinion is that less than 1 per cent. of the child population falls into this category.

All that can reasonably be said about this small sample population is that the percentage of epileptic children below average intelligence was rather higher in the groups with frequent and major seizures; and that, compared with the normal school population, there were rather more children below and fewer above, average intelligence. It would, however, be very misleading to form an opinion of the intelligence of epileptic children from experience of children in special schools.

**BEHAVIOUR**

Of the 365 children examined, 44 (12 per cent.) were described as emotionally disturbed or badly behaved. These 44 children may be classified as follows:

- 28 were boys and 16 were girls.
- 37 had major and 7 minor epilepsy.
- Six had daily seizures; twelve had seizures at least once a week, six at least once a month; three about once every 3 months, two about once every 6 months, and the other fifteen infrequently.
- Nineteen had an I.Q. below 70.
- Thirty were in ordinary schools; five were in special schools for educationally sub-normal children; and nine had been excluded from school.
- Seven were attending child guidance clinics; two had been in mental hospitals.

The following selection of case notes illustrates the various behaviour and emotional difficulties exhibited:

**GIRL, AGED 13 YEARS (I.Q. 54).**—Used to have severe major attacks but last had one 9 months before examination; on phenobarbitone and epanutin. Would be well behaved and good-natured for weeks and would then suddenly become bad-tempered and quarrelsome and kick and scream at anyone who remonstrated with her; almost certainly ineducable and unemployable.

**GIRL, AGED 7 YEARS (I.Q. 67).**—Major attacks weekly. On phenobarbitone. Restless; violent with other children; destructive; created pandemonium in school and had to be excluded.

**BOY, AGED 6 YEARS (I.Q. 111).**—Daily attacks of petit mal. No treatment. Was obstinate and very disobedient and

**TABLE III**

<table>
<thead>
<tr>
<th>Frequency of Fits</th>
<th>Major I.Q.</th>
<th>Minor I.Q.</th>
<th>Total Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>85 or Above</td>
<td>Below 85</td>
<td>85 or Above</td>
</tr>
<tr>
<td>At least once a week</td>
<td>14</td>
<td>16</td>
<td>21</td>
</tr>
<tr>
<td>&quot; &quot; once in 1-4 weeks</td>
<td>16</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>&quot; &quot; once in 1-3 months</td>
<td>21</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>&quot; &quot; once in 4-6 months</td>
<td>20</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>Longer than 6 months</td>
<td>117</td>
<td>43</td>
<td>29</td>
</tr>
<tr>
<td>Totals</td>
<td>188 (66 per cent.)</td>
<td>95 (34 per cent.)</td>
<td>63 (78 per cent.)</td>
</tr>
</tbody>
</table>
came home late at night. Mother was happy-go-lucky and had no control over him, or over an elder non-epileptic brother who was just as badly behaved.

**BOY, AGED 10 YEARS (I.Q. 83).—**A major attack about once a month. No treatment. Was obstinate and disobedient. In school he cheeked his teacher and from time to time during prayers muttered audibly, "old skinflint, old skinflint," to the teacher's annoyance and his classmates' delight. He sat at the back of the class and ignored the teacher except when he set out to goad her.

**BOY, AGED 8 YEARS (I.Q. 114).—**Daily attacks of petit mal. On phenobarbitone. He was spoilt by his mother during his father's absence abroad for 4 years, and on his father's return became jealous of him and once told him to go away and get killed. Very disobedient at home and had violent fits of temper when he threw things at his mother. He gave no trouble at school.

Since about 60 per cent. of the emotionally-disturbed children were below average intelligence (almost half being feeble-minded), it is impossible to say how much of the bad behaviour was due to innate poor intelligence, to epilepsy, or to a combination of both. Some of the parents were, themselves, emotionally unstable. It is noteworthy that only eight of the seventeen children with average, or higher, intelligence had parents who appeared to be emotionally mature.

If this sample population was representative, the bulk of epileptic children outside institutions are no more difficult than normal children; those who are emotionally disturbed are, however, exceedingly troublesome.

**MEDICAL TREATMENT**

That most parents become seriously concerned when their children develop epilepsy is emphasized by the fact that 236 (65 per cent.) of the 365 children had been to hospitals for investigation and advice: 24 were known to have had an electroencephalogram examination.

Treatment appeared to be inadequate in 36 cases, and a few children were having no treatment. The following cases are typical:

**GIRL, AGED 11 YEARS.**—Had had severe major attacks since the age of 5 years; they were occurring about once a fortnight, and she had had six in school. Her only treatment was ½ gr. phenobarbitone once nightly.

**BOY, AGED 13 YEARS.**—Had been having major attacks at about monthly intervals from the age of 3 years. He had had no treatment. According to his mother, one doctor told her to give the boy "Epsom salts", and another doctor told her not to worry as the lad would "grow out of it".

**BOY, AGED 14 YEARS (I.Q. 107).**—Had been having about three major attacks a fortnight, and they were becoming more frequent and more severe. He was on ¼ gr. luminal thrice daily which he fetched periodically from his doctor's surgery, but he had not seen the doctor for over a year.

Although the majority were having satisfactory treatment, it was distressing to find some who were not receiving the care they required. Sometimes the parents were at fault, at other times the doctor. Most of the patients had responded to treatment; 73 per cent. had fits less frequently than once a month, about half of these at intervals longer than 6 months, and about a quarter had none for over 2 years. On the other hand fifty children (14 per cent.) were becoming worse or showing no improvement; of these 33 were receiving no treatment or treatment that was unsatisfactory; 39 had grand and eleven petit mal.

Although a prognosis should always be cautious, that is no reason for giving the parents of an epileptic child no hope, as the following case histories show:

**GIRL, AGED 14 YEARS (I.Q. 105).**—Began to have attacks of petit mal at the age of 3 years; and had at least twenty to thirty a day. She was taken to a well-known London hospital and saw one of the senior physicians, who, according to the mother, pronounced that the child was "incurable" and would deteriorate. Though shaken, the mother was unconvincing; she went to another hospital, and here received the sensible advice that it was not possible to prophesy, then and there, how the child would progress; but, that if the parents persevered with the prescribed treatment, and handled the child with understanding, realizing her need for kindly discipline, there was a reasonable chance that the fits would be controlled. Eventually, the girl was sent to a special school for epileptics where she remained three years. When seen she was a pleasant, well-developed girl, and had been free from fits for more than a year.

**BOY, AGED 9 YEARS (I.Q. 128).**—Developed major and minor fits at the age of 5 years; at the beginning he had more than one hundred minor seizures a day and often injured himself when in a major fit. His parents were given a gloomy prognosis, but he attended a special school for 2 years. When seen he had been free from fits for 2 years and was doing well in an ordinary school. His home care was good.

If this sample population was representative, the prospect for a child with epilepsy is not so bleak as is often supposed.

**FAMILY CARE**

The high standard of parental care was impressive. All but a very small minority of the parents were
worried about the effect epilepsy might have on their children's prospects of employment and on their health and happiness when they left school. Some were over-anxious and others were emotionally unstable, but, according to their lights, they were doing their best for their children, although their efforts were often misdirected. Only nine of the 365 children appeared to have neglectful and careless parents; these families were well known to the school medical officers and teachers.

A difficult situation arose where a parent was so solicitous for his child's welfare that he (or more often she) had lost all sense of proportion, and by isolating the child from his fellows was undermining his will and placing his future in peril. The following cases are typical of this situation:

**Boy, aged 10 years (I.Q. 120).**—Had had major fits about once a fortnight from the age of 4 years. His mother was anxious and over-protective and would not permit him to take part in any game or physical exercise at school; immediately school was over he had to return home and was not allowed out unless accompanied by an adult. He was an only child and had no companions. He was intelligent and sensitive but miserably unhappy; his one desire was "to be sent away to school", and this oft-repeated wish had upset and hurt his mother.

**Boy, aged 13 years (I.Q. 90).**—Was having mild, major fits every few days, and at one time they had been severe. He had not been to school since the age of 5 years and was having treatment from a herbalist. His parents had refused to send him to a special school, and he spent his days in a back kitchen, was forbidden to do anything on his own, and never played with other children. He was in a pitiable state, illiterate, and very unstable emotionally.

In many ways, the lot of a child who was brought up in a dirty, feckless household, but was at liberty to associate with his fellows, was preferable to the life led by the two boys whose cases are described above.

**Education**

Of the 430 children known to be epileptic, and presumed to be educable, 317 were in ordinary primary or secondary modern schools, thirteen in grammar schools, 49 in special schools for epileptics, eighteen in schools for the educationally sub-normal, and six in schools for delicate children. The remaining 27 had been excluded from school, some for what appeared to be slight cause, and a few of these had received no education whatever. The following cases are typical:

**Girl, aged 13 years (I.Q. 95).**—Had never been to school. She was having several major and minor fits a day. She was well-behaved and took a pride in her appearance but was illiterate.

**Girl, aged 10 years (I.Q. 114).**—Used to have frequent major attacks and had last had one a month before examination. She had never had a fit in school; since most of them occurred at night, but she had been to school for a few days only in the past 3 years and was illiterate; the head teacher had discouraged her attendance lest she had a fit in school.

**Boy, aged 14 years (I.Q. 94).**—Had a major attack four months before examination; they used to be more frequent. He had been excluded from school 18 months previously and was spending his time cycling round the neighbourhood or attending the public swimming baths on his own.

Of the 365 children examined 35 appeared to be possible candidates for special schools for epileptics, although five of them might, on trial, have proved ineducable. If this estimate is correct and if this ratio is applied to the whole country it would seem, when allowance has been made for parental refusals, for children near school-leaving age, and for those who might be found to be ineducable, that accommodation in special schools (taking into account the children already there) is likely to be required for not more than 0·2 per 1,000 of the school population. In the earlier survey it was suggested that 0·3 per 1,000 children should have been in special schools for epileptics; but that survey was carried out by questionnaire and made no allowance for parental refusals, or for children who might have been found ineducable after trial. A rate of 0·3 per 1,000 would necessitate about 1,500 places in special schools, whereas if the rate was about 0·2 per 1,000 of the present school population of England and Wales only about 1,000 places would be required.

When the first survey was made in 1946 there was accommodation for 660 epileptic children in seven special schools. There are now over 800 epileptic children in eight special schools, and plans have been approved for another 200 places, including a small school for epileptic children with emotional or behaviour difficulties.

If the child population sampled in this second survey was representative of the whole, it may well be that the demand for special schools for epileptic children will be met within the next few years when the present building programme has been carried out. Modern drug treatment has undoubtedly controlled the seizures in many children who would formerly have been recommended for a special school.

It cannot be stated too often that the great majority of epileptic children should attend ordinary school.
FITNESS FOR EMPLOYMENT

It would be unwise to be dogmatic on this subject but, on the available evidence, it was considered that at least 33 (9 per cent.) of the 365 children would almost certainly be unemployable. In 31 of these the main reason was poor intelligence: sixteen had an I.Q. below 55, fifteen between 55 and 60, and two between 61 and 70. Nine had fits at least once a week, another nine had them at least once a month, and eight had seizures at longer intervals than once in 6 months.

Although a few of the others might become unemployable if their fits remained uncontrolled, it appeared that the great majority would be able to earn their living.

SUMMARY

(1) In a population of 355,000 school children from East Anglia, part of the metropolitan area, and certain home counties and northern towns, 430 epileptic children (1·2 per 1,000 school children) were identified.

(2) There were 250 boys and 180 girls; 316 had grand mal, 65 had petit mal, and 49 had both.

(3) Of the 430 children, 365 were examined and the following information was collected:

(a) Frequency of Fits.—73 per cent. had seizures less frequently than once a month: in 52 per cent. the interval between fits exceeded 6 months; 38 per cent. had been fit-free for at least one year, and 14 per cent. for more than 3 years. Only 9 per cent. had fits in school.

(b) Intelligence.—31 per cent.* (as compared with 25 per cent. of the general population) had an I.Q. below 85; 42 per cent. of those who had fits at least once a month had an I.Q. below 85 compared with 27 per cent. of those who had seizures at longer intervals. It is misleading to assess the intellectual capacity of epileptic children on experience gained in special schools where about 70 per cent. have an I.Q. below 85.

(c) Behaviour.—44 (12 per cent.) presented problems of behaviour; nineteen of these had an I.Q. below 70; some had very unstable parents. In short, the great majority of epileptic children outside institutions and special schools are no more difficult than normal children.

(d) Medical Treatment.—Although satisfactory in most cases treatment appeared to be inadequate in 36. 65 per cent. of the 365 children had attended hospital for investigation: 24 had had an electroencephalogram examination; fifty (14 per cent.) were either becoming worse or showed no improvement.

(e) Family Care.—In the great majority of families the children were given the greatest possible care. There were more over-anxious and over-protective parents than there were careless or indifferent ones.

(f) Education.—Of the 430 children known to be epileptic, 317 were in ordinary primary or secondary modern schools, thirteen in grammar schools, 49 in special schools for epileptics, 24 in other types of special school, and 27 had been excluded from school. When those already in special schools are included, it is estimated that 0·2 per 1,000 school children require treatment and education in special schools for epileptics.

(g) Employability.—33 (9 per cent.) would almost certainly be unemployable, mainly because of poor intelligence. A few others might become unemployable if their fits remained uncontrolled.

I acknowledge with gratitude the information and help given to me by the school medical officers of the areas chosen for the enquiry. They found the children for me and arranged my programme. That practically all the parents welcomed my visit was due to the influence of the school medical officers.

REFERENCE