REFRESHER COURSE FOR GENERAL PRACTITIONERS

CHRONIC ILL-HEALTH AND RESPIRATORY INFECTION IN CHILDHOOD

BY

J. J. KEMPTON, M.D., M.R.C.P., D.C.H.*Paediatrician, Reading Area Hospitals; Paediatrician, Canadian Red Cross Memorial Hospital, Taplow; Assistant to Out-patients, Hospital for Sick Children, Great Ormond Street*

There is a very common picture of general ill-health associated with chronic or relapsing respiratory infection, and having its greatest incidence in the first years of school life. It comprises at least one-fifth of the cases referred to children's out-patient clinics and is well known to all who conduct such clinics; indeed, it must be well known to every doctor. It suffers, however, from being not readily amenable to academic description. It is too diffuse and vague, and includes too many cases differing in detail, to fit the concept of disease entity or even syndrome. If it is divided into parts or narrowed down to "sino-bronchitis" much of the essentially composite picture is lost.

There is a basis of general debility and fatigue, recurrent colds, and recurrent or persistent cough. Added to these are the various other manifestations of minor or borderline ill-health—pallor, poor or fickle appetite with failure to gain weight, indigestion and bilious attacks, and interference with sleep. Added, too, are the multiple minor abnormalities of behaviour which become so much more apparent in the child who is never really well. There is usually a postural defect which tends to be particularly marked in the child of asthenic physical type.

Besides varying in detail, the picture varies greatly in degree, merging on the one hand with the normal and on the other hand with its more clearly defined complications. Probably about one-fifth of the children at this age in England present clinical or radiological evidence of some persisting upper respiratory infection, and only a small proportion of children at this age could be described as having perfect posture. The decision on where definite illness emerges must be an arbitrary one.

With this uncertain outline, it is not surprising that the picture, common, well known, and troublesome as it is, does not receive much attention as such in the modern textbook, though if we look back to the more discursive, less precise books of 50 years ago we find detailed descriptions in plenty. Eustace Smith in 1899 described these children as suffering from "mucous disease." He noted the greenish yellow mucus in the back of the throat, and thought that their multiple symptoms and chronic ill-health were due to failure to absorb adequate nourishment owing to similar mucus lining the whole digestive tract. G. F. Still thought the cause was infected adenoids, and this is still believed by many people. Sir Robert Hutchison quotes Eustace Smith in giving his own vivid description, but does not altogether accept either the "mucous disease" theory or the adenoids. He emphasizes the importance of considering the whole child and his surroundings and especially his diet.

It is suggested that it may still be a reasonable idea to attempt a general account of these children in terms of the development of their illness and of its treatment.

Development of the Picture

A shooting-up stage in growth occurs during the first years of school life. The rounded limbs and body of the toddler change to ribs that "stick out" and "skinny" arms and legs. This normal change has long been commercialized, and itself may cause anxiety and unnecessary treatment. At the same time it is a stage during which the normal erect and alert posture and carriage can easily droop and slump with any illness or with any minor cause of fatigue.

Also at this time usually comes the first massive contact with the cross-currents of respiratory infection, and frequent colds are so common an accompaniment to starting school as to be almost a normal course of events. It is when infection settles in a mild chronic form in one or more of the nasal sinuses that the picture of persistent ill-health may gradually emerge. Cold follows cold with quite abnormal frequency—"He's no sooner rid of one than he starts another." A persistent cough, usually noisy and ineffective, becomes established both at home and in school, and disturbs sleep at night. The tired droop becomes a persisting postural defect—a kyphoscoliosis with widely separated scapulae, forward sloping head, and open mouth. This habitual position further impairs the proper function of the respiratory passages, so making infection more likely to persist.

Cough is probably the commonest presenting symptom. One may presume that mucopus in the nasopharynx is the commonest cause of cough in childhood. Cough and mucopus there are so very commonly associated, and the cough stops when the nasal infection has cleared. Also, iodized oil of about the same viscosity as mucopus placed in the nose at night can be radiologically demonstrated in the lung fields next day.

The full picture of ill-health may develop slowly or rapidly and, once the vicious circle has become established, may persist for months or years, improving a little in the summer or after a holiday by the sea, becoming as bad as ever after a fresh recrudescence of infection or an attack of measles or pertussis, and continuing in a mild chronic form or with more acute episodes of febrile bronchitis. Sometimes other symptoms, abnormalities of behaviour, or periodic episodes with fever and pallor, or headache and vomiting, may take chief place in the parents' story against a background of cough and colds and general failure to thrive. A minority develop the more serious or clearly defined complications. Segmental collapse-consolidation may present acutely as pneumonia, or bronchiectasis may slowly appear, though the latter is more common when respiratory infection dates from infancy. Recurrent attacks of follicular tonsillitis may occur independently, but are often associated with sinus infection, as is middle-ear inflammation. More commonly the tonsils and adenoids undergo the degree of hypertrophy which seems to be

normal at this age, without themselves being the seat of any obvious infection or necessarily having any bearing on the problem.

Examination and investigation are simple procedures. The pallid round-shouldered child does not require further general description. Mucopus may be visible in the nose, crusted in the handkerchief, or as a greenish-yellow drip on the posterior wall of the pharynx. There may be some rales at the lung bases which will often disappear after coughing or a few deep breaths. In the great majority of cases no radiological or other hospital investigation is required in the first instance. A haemoglobin estimation and a tuberculin test are useful in any indefinite state of ill-health in childhood, and, together with the simple testing of urine, can and should be carried out by the general practitioner or the school medical officer. It is unusual for a radiograph of the sinuses to give evidence of infection which is not apparent on careful examination of the upper respiratory tract by ordinary methods and with ordinary equipment, and a radiologically opaque antrum may sometimes be shown not to be infected. A radiograph of the chest is not needed unless there are persistent chest signs, or symptoms in spite of treatment, when an area of collapse is to be suspected. Many of these children nevertheless do become chronic hospital out-patients, their case-note envelopes becoming thicker with the years and their x-ray covers stretching to bursting point.

Ultimately, recovery to normal health in the filling-out stage of growth which precedes puberty is the general rule; but in many cases there is a residual catarrh which persists as a slight impairment of health in adolescence, or there may be a degree of permanent postural defect.

Treatment

There is probably no group of cases in which treatment as generally carried out is so irrational and ineffectual. These children constitute the main market of the industries producing the vast quantities of cough mixtures which are still used, the tonic vitamin preparations, and the jars of malt syrup which most of us remember from our own childhood. Cough mixtures and vitamin tonics are still the first line of treatment usually adopted by the doctor, though there is no evidence that cough mixtures have any therapeutic value in these cases or that vitamin deficiency now plays any part in causing this sort of ill-health. Medicines containing alkaloids of the morphine and atropine groups, by diminishing secretion and making it more viscid, may make bronchial plugging more likely and so may do harm. It is difficult to see what possible good the malt syrups can do, though they do at least taste pleasant and are a firmly established part of tradition.

Rational treatment of this very common picture presents a problem in co-operation and should have three main aims: rest, nasal treatment, and exercises.

Rest

There is an obvious element of fatigue, and adequate rest in the often overcrowded, wireless-ridden homes of to-day may be difficult to obtain. Adequate rest means early to bed, and for younger children a short rest after the midday meal and the occasional old-fashioned day in bed.

Nasal Treatment

Sinus infection usually clears up on treatment with 1% ephedrine and 1% mild silver proteinate B.P. in saline used

as nose drops twice or thrice daily for a period of about six weeks. That this has a decongestive action favouring drainage, and also slightly increases secretion, can be observed, and it has been shown to do no harm. Treatment must be carried out regularly with the head held vertically downwards and backwards (see illustration), about

Photograph showing how to instil nasal drops.

half a dropper-barrelful of the solution being used each time. Substances instilled into the nose too often find their way over the upper lip or face, or along the floor of the nose and straight into the pharynx, so the proper technique is important. There is little discomfort, and almost all children accept the treatment without difficulty. The course may need to be repeated some months later. If, in spite of this, infection persists, treatment by irrigation or displacement under the care of an ear, nose, and throat surgeon may be required, and this may be combined with medical treatment such as a course of a sulphonamide preparation, depending on the organisms found in the washings.

Removal of tonsils may be indicated by the occurrence of several observed attacks of tonsillitis, or removal of both tonsils and adenoids when, as uncommonly happens, they are so hypertrophied as to cause obstructive symptoms and signs.

In most cases of nasal infection, if treatment with ephedrine and the mild silver proteinate is carried out with real thoroughness and attention to detail it restores adequate drainage and the sinus infection clears up without any further trouble.

Exercises

These aim at restoring normal posture and normal breathing, and consist mainly in rhythmical breathing and swinging and stretching movements which are best done in small classes. Their success is acutely dependent on the ability and personality of the instructor, and they can easily become a useless ritual. In addition there should be improvised feats and games, using wall bars, the climbing frame, and the climbing net. Normal posture is ultimately dependent on righting reflexes, and it is through these that climbing and feats involving balance help to restore the normal.

Exercise on these lines should be given at first once or twice weekly, and later for a short period of about half an hour daily. The simple equipment and instruction required should ideally be a part of every school, when all that would be required would be some special attention to the individual child. As it is, the provision of exercises without too much loss of school time is the greatest difficulty, though the problem and the possibilities are being considered, as can be seen in the Ministry of Education's report *The Health of the School Child* published in 1949.

Rest, nasal treatment, and exercises are needed in every case. In a few cases anaemia will need treatment,

or orthodontic treatment may be required, and in a few also, where home circumstances are very bad, a period of convalescence may help.

It is all-important to ensure that the three main aims in treatment are followed simultaneously. The posture will soon relapse if a chronic nasal infection is allowed to continue, and nasal infection will soon recur in the child whose drooping shoulders and open mouth have remained uncorrected, while both treatments will fail in the child who is chronically overtired as a result of his illness.

When such combined treatment is possible a return to full normal health can usually be expected in three to four months.

CHEMICALS IN FOOD

The Food, Agriculture, and Fine Chemicals Groups of the Society of Chemical Industry held a Joint Conference at the Wellcome Research Institution, London, N.W.1, on September 27 and 28 under the general title "Problems Arising from the Use of Chemicals in Food." Twelve papers, dealing with a wide variety of deliberate and incidental additives, were presented and discussed. Special consideration was given to the possible effects of additives on man and to their desirability in food processing and handling.

In his opening address, Dr. G. ROCHE LYNCH reviewed the history of the use of chemicals in food. Accum's treatise on the subject of adulteration (1820) had been the forerunner of others which had culminated in the Food and Drugs Act, 1860. There then had followed a period of well-meaning though unenlightened use of such preservatives as boric acid and formaldehyde, but abuses had developed. To-day the prime reason for the use of additives was the world shortage of food. They were used to increase production and to facilitate processing and the efficiency of the necessary marketing operations of packaging, storage, and transport. In the consumer's interest controlling legislation was needed for the large number of different types of chemicals now in use; nevertheless, reputable food manufacturers were taking an active interest in the problem and were keen that "good commercial practice" should be observed.

Dr. H. E. COX said that the physiological action of many of these surface-active agents, which had to some extent displaced gums, lecithin, and egg yolk, was largely unknown. They had little or no food-value, but could be used to replace as much as 50% of the fat required in some products: this, however, was regarded as a misuse in normal times, when they should be used solely to obtain satisfactory mixtures and dispersions. Amounts added rarely exceeded 1%, and were usually much less. Ethylene glycol was not recommended, and further work was necessary on acetyl-tartaric acid, polyoxyethylene, and sorbitan esters. It was doubtful, also, whether ethanolamines, morpholine, pentaerythritol, or their monoglycerides, were suitable for inclusion in foods.

Preservatives

Dr. F. H. BANFIELD said that it was unreasonable to condemn synthetic additives simply because they were synthetic. Work on any new additive should include a study of its acute and chronic toxicity, its absorption and metabolism, the mode and rapidity of its excretion, and its effect on other food constituents and their metabolism and on the alimentary micro-flora. Preservatives should never be used for unreliable products or to cover careless handling. Of the commoner preservatives benzoic acid was not cumulative in effect, and amounts up to 0.5 g. a day seemed harmless; sulphur dioxide was excreted rapidly, and an adequate safety margin was provided in

its permitted uses. Propionates (as anti-mould agents), *p*-hydroxybenzoic esters, and ethyl vanillate had proved satisfactory in toxicity trials. Dehydroacetic acid was of doubtful toxicity. The use of antibiotics in food processing must be viewed with great suspicion.

Antioxidants

Dr. C. H. LEA distinguished true antioxidants—for example, polyphenols which act as chain breakers in the autoxidative processes—from synergists which enhance the activity of the former. A further class included agents which form inactive complexes with copper, manganese, or iron. Many polyphenols occurred naturally in foods, and others were introduced during the process of smoking meat and fish. The artificial addition of antioxidants was now practised in the United States. Tocopherols, citric, ascorbic, and probably gallic acids, and lecithin occurred naturally, so that their addition presented no new circumstance. The addition, as antioxidants to food, of about five phenolic and five non-phenolic substances had recently been permitted in the U.S. after comprehensive acute and chronic toxicity tests. But on similar grounds hydroquinone, catechol, and thiourea had not been permitted. Of the purely artificial compounds the thiopropionic esters and the tetra-alkylthiuramdisulphides had been shown to have low toxicities.

Manipulation of Flour

Dr. A. J. AMOS explained that the reason for adding improving and bleaching agents to flour was to effect promptly beneficial and desirable changes in flour properties which could be achieved only slowly by natural means—that is, to effect an artificial "ageing." The use of yeast foods by the baker allowed the bread-making potentialities of a flour to be developed to the full and a more uniform standard of bread quality to be maintained. These treatments enhanced the nutritional importance of bread, which to-day provided over 30% of our protein and contributed significantly to our vitamin requirements. Following the discovery that nitrogen trichloride could give rise to canine hysteria, the remaining commercially used improvers and bleachers and the officially favoured replacement for nitrogen trichloride—namely, chlorine dioxide—had been subjected to extensive and stringent feeding trials not only with animals but also with human subjects, and not one of them had given the slightest evidence of constituting a hazard to health.

Colours and Flavours

Dr. P. R. PEACOCK'S paper on colouring materials was read in his absence by Mr. A. L. BACHARACH. Dr. Peacock stressed the importance of the aesthetic appeal of foods, and then developed an argument for the ideal of no additives except possibly those of natural occurrence. In the absence of that ideal state, he drew attention to some of the problems involved. No completely new synthetic chemical could, from its chemical structure alone, be pronounced "safe" with certainty; chemical similarity with other substances was not an infallible guide, though analogy might be used with success up to a point. Carcinogenicity towards animals should bar a substance from human consumption even though the latent period might be much greater in the latter circumstance as with β -naphthylamine. Bioassays were lengthy, but Miller's recent work on the fixation of carcinogens by liver protein might be developed to advantage. In the ensuing discussion emphasis was laid on the excessive doses of carcinogens and potential carcinogens fed to animals over prolonged periods: in similar experiments, sodium chloride would probably prove fatal.

Concerning flavours, Mr. G. N. REVIE indicated that, because of the high ratio of solvent to flavouring constituents, attention was primarily directed to work on the toxicity of solvents.

Agricultural and Inorganic Residues

Dr. R. A. E. GALLEY said that consumer hazards associated with the use of toxic chemicals in agriculture were