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CATARRHAL INFECTION AND THE CATARRHAL CHILD.*

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THERE are, perhaps, three features characteristic of practice among infants and children which differentiate it from similar work among patients of adult age. In the first place, the young child has a need for food and powers of digestion and of absorption of food, which, relatively to those of the adult, are very much greater. In the second place, the nervous system of the child is highly unstable, and functional nervous disturbances of all sorts are both more common and more severe. In the third place, there is at that early age a much greater liability to catarrhal infections in all situations, and to a secondary inflammation of all the lymphatic structures which serve the mucous membrane attacked.

NASAL CATARRH IN INFANCY.

Of the children attending such an out-patient department as mine at Guy's Hospital a very large proportion is suffering from catarrhal infection in one situation or another. A chief difficulty with which we have to contend in the attempt to improve the health of the children in cities is the frequency and prevalence of these household and school infections.

It may, perhaps, be helpful to tabulate the especial difficulties which follow upon nasopharyngeal infection in an infant, thus: (1) Interference with suction; (2) ready extension to the middle ear or to the bronchi; (3) apparent metastasis of catarrh; (4) accompanying gastrointestinal disturbance.

Interference with Suction.

The secretion of breast milk depends almost entirely upon one single factor—the efficient and complete emptying of the breast at regular intervals. The infant, born with almost all other functions in abeyance, yet possesses in extreme perfection this power of suction. Close analysis of the reasons for the genuine failure of lactation

convinces me that they are almost always to be found in certain prejudicial influences acting upon the suction of the young infant.

Of these prejudicial influences perhaps the most common is a state of nervous unrest on the baby's part. The suction of an infant is not a voluntary but, to a great extent, a reflex act. It proceeds only efficiently when the child is quiet and at peace. When tremulous and over-excited the suction is incoördinate and ineffective, and results in a great deal of aerophagy and in a very small yield of milk. With such faulty suction hunger adds to the unrest, while the yield in a breast so little stimulated rapidly declines. The woman's failure is not primarily in lactation, but in her power to quiet the restless nervous system of the infant. Emotional states of such extreme violence are found in the human infant only. Among the young of other animals we find nothing at all comparable.

But if nervous unrest of the child is the most common cause of failure to nurse in early infancy, the next in frequency is provided by the cases of nasal obstruction from rhinitis, which we are now considering. Infants so readily breathe with their mouth open, and suffer so little discomfort, when at rest, from very severe nasal obstruction, that it may be necessary, in order to appreciate the degree of obstruction, to observe the child during the act of suction when the mouth is occupied by the nipple. The dyspnoea and distress may then become very obvious. After a few hurried suction movements the nipple must be let go. Aerophagy and, perhaps, the subsequent vomiting of the little milk obtained, are very common. The mother, feeling only the faulty inefficient suction, often adopts the fanciful explanation of "tonguetie."

Clearing the nostrils just before nursing with a few drops of alkaline lotion, such as sod. bicarb. 1 per cent., purified borax 1 per cent. in water, is often effective. Sometimes silver nitrate 1 per cent. will succeed. In bad cases a few drops of 1 in 1000 adrenalin solution will often allow suction and respiration to proceed simultaneously, when without its use suction and respiration proceeded, as it were, time about. The breast pump must be used for some time after each nursing to supplement the suction exercised by the child.

The Ready Extension to the Middle Ear or Bronchi.

The shortness and width of the Eustachian tube determine the circumstance that some degree of otitis media seems almost invariably to accompany

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an acute nasal catarrh in an infant. A recurrence of pyrexia, after an interval of some days of normal temperature and partial recovery or improvement, is always suggestive of otitis media. Paracentesis of the membrana tympani usually brings about rapid relief. In general, the otitis media of young infants is singularly free from complications. It may be said that the infection is almost always confined to the lining membrane and that involvement of the bone does not occur. Great enlargement of the cervical glands, and especially of the gland lying in front of the ear, and the development of facial paralysis are the characteristic symptoms of that form of otitis media in which alone in infancy the bone is involved—tuberculous otitis media. Of the frequency of bronchitis or broncho-pneumonia as a complication I need not speak.

The Apparent Metastasis of Catarrh.

With a severe catarrh of the upper air passages the loss of weight may be considerable, and as a result of the nutritional disturbance infective processes in parts remote from the naso-pharynx may rapidly become apparent. For instance, the gums around the erupting teeth almost always become sore and ulcerated. Contact of the skin with the urine and with the fæces rapidly causes a dermatitis around the prepuce and the anus, and the skin may show various forms of catarrhal reaction, erythema, furunculosis, intertrigo, &c. In adults we speak of "terminal infections." The loss of weight in infants may be so rapid and so great—amounting sometimes to one-sixth or even one-quarter of the body-weight—that the resistance of all parts of the body against infection falls to a very low level.

The Accompanying Gastro-Intestinal Disturbance.

In infancy the difficulty is especially great because of the accompanying secondary dyspepsia. The digestive function, at that age so highly developed, is for that very reason highly unstable, and the underlying naso-pharyngeal infection is often overshadowed by the violence of the gastro-intestinal disturbance which it has provoked. Very often the mother comes complaining that the breast has suddenly begun to disagree with her infant, and that it now causes profuse diarrhoea and vomiting. Often she has already weaned it from the offending milk. Yet a glance at her own lip will often show a tell-tale patch of herpes labialis, and she will complain of the headache, fever, and coryza which assailed her perhaps during the previous week. Each has responded to the infection in characteristic manner. The liability of mother and child to share the same infection is very great. If, on the other hand, the infant is bottle-fed such a dyspepsia arising *ex infectione* is even more apt to be regarded as affording proof of the unsatisfactory nature of the present diet. Change after change is made, each prescription in turn falling into disrepute until

one, perhaps in itself a very ill-regulated and ill-balanced diet, which happens to be tried at the moment of recovery from the infective disturbance, appears to have "suited," and bears the credit which it has done nothing to deserve. In all our attempts at dietetic therapy in infancy we are beset by this difficulty, that infection obscures the evidence on which we must rely. When a new and incalculable and uncontrollable factor is added such as a state of infection, we can often make no sound deduction as to the suitability or otherwise of the dietetic prescription.

It is in the dyspepsia secondary to catarrhal infection that the lactic acid milk of Howland and Davidson is especially useful. To a pint of milk (in feverish states it is best to use milk from which some part of the fat has been removed) a drachm of lactic acid (B.P.) is added drop by drop. After each drop is added the whole is stirred vigorously. It is best to use a tall beaker or jug rather than a flat vessel to contain the milk. The whole process must take as long as ten minutes or a quarter of an hour. About the point at which the last drops of the lactic acid are added, the milk will suddenly show the finest possible flocculent precipitate, so fine that it easily passes through the teat of the bottle. The milk is then sweetened by the addition of sugar, one ounce to the pint. When the stools have been bulky, foul-smelling, and full of curds this device is often immediately successful.

CATARRHAL INFECTION IN BOARDING SCHOOLS.

There has recently been considerable discussion of a very interesting character between the medical officers of some of our large boarding schools as to the best way of preventing or controlling these devastating outbreaks of catarrhal and influenzal infection, which do so much to interfere with school life. Especially the claims of preventive inoculation have been debated.

Where highly susceptible children and adolescents are crowded together in unsuitable buildings I doubt whether any medical measures will avail. It seems to me that the problem in reality concerns the architect in the first place rather than the doctor. When the same attention is paid to the architectural necessities of boarding schools that is now paid to the architectural necessities of hospitals, these epidemic infections will become controllable. Formerly it was the hospital which had to close its doors from time to time because of epidemic infection; now it is the school. In the smaller schools a good-sized bedroom, with windows or windows facing in one direction only, and therefore with little current of air, is often made to serve as a dormitory for four, six, or eight boys. In the dormitories of public schools the beds are often close together and the ventilation is insufficient. Of the ventilation of "studies" in many public schools the less said the better. I have visions of a long and well-lit corridor, on one side of which are beds separated by partitions, in part perhaps of glass, eight feet high. Behind each bed

is a window which is directly opposite the window on the opposite wall of the corridor. A sanatorium, which is usually almost empty or completely inadequate to cope with the number seeking admission, would on such a plan be unnecessary, since blocks of such sleeping accommodation could be isolated and added to or subtracted from the accommodation necessary for illness. The cost of such buildings should not be excessive, and the architectural ambitions of the school might well be concentrated on such buildings as the chapel, the library, "big school," and so forth.

TYPES OF CHILDREN PRONE TO CATARRHAL INFECTION.

The Exudative Diathesis.

In pædiatric literature to-day a great deal is written of the so-called exudative lymphatic diathesis, and we may take it that Czerny's description of this inherited and constitutional peculiarity is generally accepted. Children with the exudative diathesis have certain well-marked characteristics. In general they are marked by a tendency to retain a high content of lymph in their bodies. Yet the excess of fluid is held somewhat loosely. Their body-weight is therefore often subject to extreme fluctuations. The words "hydrolabile" and "poikilo-osmotic" have been coined to describe this peculiarity. At times we may meet with them in the dehydrated condition, at other times they are marked by their rounded plump bodies with an excess of somewhat watery fat.

In the second place, it is characteristic that the lymphatic strictures—the lymphatic glands, Peyer's patches, tonsils, adenoid vegetations, thymus gland, and solitary follicles of the large intestine—all show some degree of hyperplasia. The exudative diathesis of Czerny corresponds clinically with the so-called status lymphaticus. All that is necessary for the bodies of such children to show the status lymphaticus after death is that that death should be sudden and should be preceded by no long and wasting illness. Hence the importance of the condition in coroners' courts, in which the circumstances surrounding such sudden deaths are made the subject of inquiry.

In the third place, it is characteristic of these children that they tend to show a variety of inveterate and profuse catarrhal and exudative processes of all sorts, nasal catarrh, bronchitis, seborrhœa capitis, eczema, impetigo, lingua geographica, mucous diarrhœa, conjunctivitis, and so forth. Their response to trivial infection is great; fulminating and virulent infections often provoke sudden death at the very onset.

In general, the children have a high fixed colour due to eczematous infiltration or catarrhal dermatitis of the cheeks and of the point of the chin. The hair of the scalp is irregular and unkempt. Often it grows low on the forehead or down the

cheeks in the form of a whisker. The feet and hands are often puffy, cyanosed, and cold. Formerly the condition was described as scrofula or the "king's evil."

The liability to contract an attenuated form of tuberculous infection in the irritated and enlarged glands is very great. In 1882 Koch, in a so-called scrofulous gland, identified the tubercle bacillus and announced to Europe that scrofula and tuberculosis were one and the same. To-day we regard this scrofulous form of tubercle as tubercular infection modified because it is implanted upon a catarrhal soil. It follows that the word scrofula has been changed in its implication by Koch's discovery and teaching. It is now applied to that part of the old scrofula which has undergone a secondary infection with tubercle, while the greater moiety which has undergone no such infection has been left without a name. If any name is applied to these cases to-day, I think it must be the inelegant appellation of T and As. Of cases which require tonsillectomy, a high proportion will be found to belong to this type described so clearly by Czerny.

The problem of treating these fat and watery children, their mucous membranes so prone to exudative reaction and their lymphatic glands so readily enlarged, is not easy.

In the first place, whether or not a secondary infection with the tubercle bacillus has taken place, they require and benefit more than most from sunlight and a free life in the open air. Whether or not artificial heliotherapy will give comparable results remains to be proved.

In the second place, a great deal can be achieved by an intelligent supervision of the diet. As a rule, the appetite is enormous, especially for bread and sugars of all sorts. They, more than other children, suffer from any excess in the intake of food over the physiological needs. Meat, fish, eggs, green vegetables and fruit should make up the bulk of their diet. Milk in large amounts is always badly borne, but it is especially the constant demand for farinaceous food which must be controlled. Cod-liver oil may be of service. From America comes the recommendation to treat such cases with large doses of the liquor atropinæ sulphatis or of tincture of belladonna. At times small doses of thyroid extract appear helpful. With some dehydration of the body the violence of the catarrhal processes may be diminished. We cannot doubt the importance of heredity—for instance, the Mongolian idiot very often shows to perfection all the signs of the exudative diathesis—yet the tendency may remain quiescent with good hygiene and a suitable dietary.

The Neuro-Arthritic Diathesis.

Very different is the type of child who shows what has been called somewhat inaptly the neuro-arthritic diathesis. The subjects of this diathesis are met with commonly enough. They are, as

a rule, sprung from an intellectual stock, with a history in the family, often of gout, eczema, or migraine. Thin and meagre, they exhaust their little bodies by the energy they throw into all the activities of life. The body is apt to be ill-braced with muscle and there is often a tendency to flat feet, knock-knee, lordosis, enteroptosis, round shoulders, and flattened chest—often kidney-shaped on cross section. Their pallor is usually a cause of alarm to the parents. The blood falls readily away from the face, leaving it drawn and worn-looking. Abdominal pain or discomfort, attacks of utter prostration marked often by extreme nervous irritability, and sometimes by the classical cyclical vomiting, are the rule. Often the body temperature shows a persistent instability for weeks or months together. The heart's action is excitable and the response to exercise bad. Functional murmurs and extra-systoles are common. Fears of tuberculosis, of chronic appendicitis, and of subacute rheumatism are commonly aroused. Complaint is often made of extreme nervousness. The appetite is usually bad. Children of this type are often inveterate cold-catchers. All the vasomotor defences against chill are ill-developed and unstable.

In general the catarrhal infection is marked, not by the severity of the local reaction in nose and throat, but by the way in which the liver appears to be caught up and involved in the disturbance. In any household in which the members are suffering from some acute infective catarrh, the child of this type will react to the infection, not as the others, but by showing one of the typical "sick attacks" or attacks of pallor, prostration, persistent slight fever, and anorexia. In these children sometimes the underlying infection may be altogether masked by the severe gastric or hepatic disturbance. A diet poor in fat but rich in sugar and starch, a daily *apéritif* of some alkaline or laxative saline, and the provision of sufficient rest will do much to improve the physique and resistance to infection. Hydrotherapy, hot and cold douching alternatively, skin friction, massage and physical exercises, all serve to improve the tone of the blood-vessels. Hot and cold douching, followed by friction, is especially successful in preventing the tendency to excessive night-sweating which so many of the children show and which is at times no doubt responsible for the cold-catching. The attempt to improve the nutrition by prescribing much milk, cream, butter, &c., always fails.

Our old friend the voracious historian narrates how that at a recent clinic in one of our well-known British post-graduate centres the physician was discussing in the ward a case of erythema nodosum with his practitioner-students, but said nothing about its treatment. It was respectfully hinted to him that that was indeed the case, but without result. Yet again, after an appropriate interval the suggestion was made, and this time a little more strongly, that something in this direction would be highly acceptable, whereupon he gravely said that the treatment was likewise "nodose."

RENAL DISEASE: SOME POINTS IN TREATMENT.*

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ON such a wide subject only a few matters of practical interest can be discussed in this lecture, and I wish therefore to lay stress on certain points in renal disease which are frequently not placed in the prominent position they deserve. I intend to deal with the treatment of "nephritis," although that word even when governed by various descriptive adjectives may be unsuitable to describe accurately all the conditions included under that term.

I am, as you all must be, very familiar with recent work on methods of estimating the renal function in different forms of nephritis. This work, both here and elsewhere, must, I think, be admitted to be somewhat disappointing in the purely practical results, both as regards prognosis where this is most needed and as regards indications for treatment. The cases where renal efficiency tests indicate a bad prognosis are often those in which clinical observation drives the physician to the same conclusion. Some patients from whom little information is obtained are just those instances in which help in prognosis is urgently required. Repetition of certain tests at intervals may, however, be of great service in indicating improvement or the reverse, and may in that way considerably influence treatment.

The reason for the frequent inability of such tests to give the information desired by the clinician is well known. The kidneys are seldom uniformly and permanently damaged in all their secreting tissues, and we know that a large amount of renal tissue must be out of action before actual insufficiency results. It is known that the renal glomeruli, and presumably also the tubules connected with them, are active for short periods in groups, then rest while others take on the function. Thus only a part of the renal tissues is active at any one time. Very many tubules and glomeruli must be completely out of action to prevent those remaining healthy from carrying on adequate renal secretion, at least for a while. The only difference is that the secreting tissues have insufficient rest. In the normal kidneys a very ample margin of safety has been provided, and we know how absolutely negligible is the result of removing one entire kidney when the other is sound. During the war I examined the kidneys of young soldiers who had died quickly from severe wounds, and in every instance a few sclerosed glomeruli could be made out in microscopic sections.

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