

Individual Studies

Common Upper Respiratory Tract Infections

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The respiratory tract accounts for a considerable proportion of the general practitioner's work.

In my own practice a consistent level of 25 per cent. of the total work is due to diseases of this system. That this is not a unique figure is supported by Pemberton (1949) who found that respiratory disorders were responsible for 33.3 per cent. of attendances in eight Sheffield practices; Stephen Taylor (1954), who quotes a figure of 20 per cent. for a S.E. England rural practice and McGregor (1950), who in his Scottish rural practice found a lower figure of 14 per cent. Dr. Logan's recent survey of eight practices, from all parts of the country showed that the respiratory tract was responsible for 25 per cent. of all attendances (Logan, 1953).

In view of the high frequency of these disorders it is surprising that we understand so little of their nature and aetiology. Occurring as they do almost entirely in general practice, they have been sadly neglected as a potentially fruitful subject for research.

It is essential to consider the respiratory tract as a single functional unit carrying out the physiological process of respiration. Pathologically, this single continuity is also of importance; we have all seen aspiration pneumonias occurring in patients with nasal catarrhal conditions.

For ease of description, however, it is of great help to divide the tract into upper and lower divisions—but it is important to realise that these divisions are purely artificial.

The lower respiratory tract is usually taken to include the lungs and bronchi and the upper tract is concerned with nasal, pharyngeal, laryngeal and tracheal divisions.

When the total volume of attendances for respiratory tract disorders is analysed it is found that the upper tract is responsible for two-thirds of this total and conditions of the lungs and bronchi for the remaining third.

Concerned as we are in this paper with the upper tract infections it is necessary to try and separate the large mass into some suitable subdivisions.

Before doing this it is appropriate to consider briefly some general physiological and pathological principles.

The respiratory tract in man has a restricted response to attack by the various bacteria and viruses capable of causing inflammation of its epithelium (Stuart-Harris, 1953). Whatever the exciting

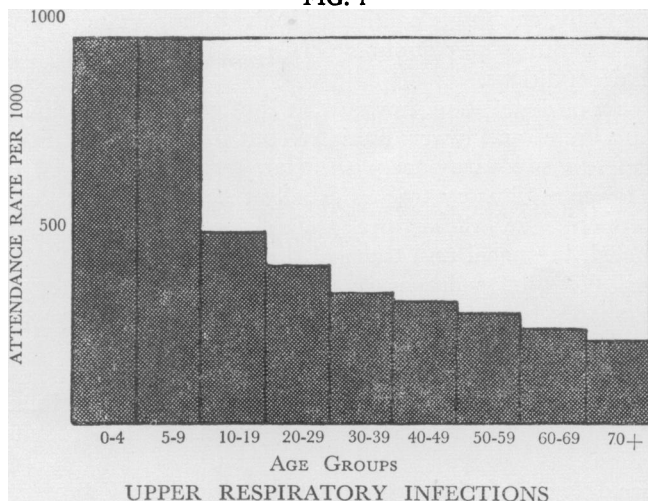
cause, an inflamed nasal mucosa can only complain by being hyper-irritable, swollen or by exuding a surface secretion of mucus and leucocytes. The resultant symptoms of sneezing, nasal obstruction and catarrh are the same no matter whether the cause be a common cold, influenza or a grass pollen. Similarly, the pharynx reacts by soreness and hoarseness, and the trachea and bronchi by cough and a sensation of substernal soreness or tightness. These symptomatic reactions have led to the use of anatomical words such as rhinitis, pharyngitis and tracheitis in an attempt at diagnostic accuracy. Unfortunately, however, such terms are neither accurate nor do they give any hint of aetiology.

The pathological reactions discussed are non-specific and it is clear that one agent may produce many differing syndromes, and *vice versa*, one clinical syndrome may be caused by more than one aetiological agent. At present we have to rely on clinical delineation of these syndromes. Laboratory studies have made relatively small advances in ascribing aetiological causes to these clinical groups, with the exception of influenza and the various bacteriological infections of the throat.

Clinical Groups

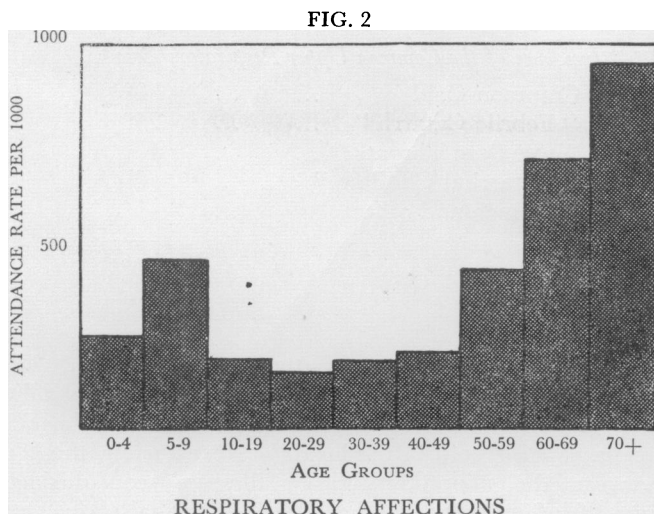
Before discussing the separate groups it is of interest and value to note the age distribution of the upper respiratory infections as they occur in my own practice. Fig. 1 shows a composite histogram for the years 1951-4.

FIG. 1



It can be seen from this that these conditions are most frequent in children under the age of 10 and then there is a fall reaching a level which remains constant even up to old age. This age dis-

tribution is in marked contrast to that of respiratory disorders (of lungs and bronchi), where there is a small peak from five to nine years and then a fall followed by a progressive rise reaching the maximum in old age (fig. 2).



Speculations are of interest, but of doubtful value. It seems possible that in the case of upper tract infections a certain period is required before a state of immunity is reached, often between seven and nine, after which a pretty constant level persists. In the lower tract the rise with age is almost entirely accounted for by the rising incidence of the chronic chest conditions, which seems to point to a degenerative aetiology.

Besides varying with age, the incidence of these conditions is markedly influenced by the seasons. In fact it is only the affections of the respiratory tract which show any appreciable fluctuations in incidence during the year. All other disease groups, including the rheumatisms, show a constant trend. It is difficult to correlate the rising incidence of these conditions with any one climatic feature. I have been unable to find any relationship between temperature, humidity or winds. As well as noting the rise in the incidence of the "coughs and colds" in the autumn and winter we are also all familiar with the increased incidence of sore throats after a hot and dry spell of weather. It seems that further research is necessary into the climatological and geographical aspects of disease. With regard to the latter aspect, it is quite certain that even in this country we see considerable variations in the incidence of conditions such as chronic bronchitis and possibly of upper

respiratory conditions ; here again further information is required and the reasons for these variations sought.

In an attempt to define clinical groups along the accepted lines the following have been found to occur most frequently in my practice :—

TABLE 1

Incidence of the Common Upper Respiratory Groups.

Common Cold	...	...	50%
" Febrile Catarrh "	...	...	25%
Acute Sore Throat	...	...	12%
" Catarrhal Children "	...	...	8%
Influenza and others	...	...	5%
			<hr/> 100% <hr/>

The Common Cold

It seems almost superfluous to attempt to define this all too common condition. So persistent and ubiquitous is this affliction that there are few differences of opinion concerning the clinical phenomena of the "cold in the head." Nevertheless, the borderline between the minor respiratory illnesses seen during the epidemics of influenza or of other febrile catarrhal states and the common cold may be impossible to define clinically. At present it is desirable to define a cold as "an acute infection involving principally the naso-pharyngeal region, usually afebrile, and accompanied by trifling constitutional upset" (Stuart-Harris, 1953). It is without a doubt the most common specific disease (if indeed it is specific) in the British Isles, and in my own practice in 1953 over 600 patients were seen for this condition (12% of the practice population), not taking into account the vast numbers who did not bother to consult me.

Maximum prevalence is during the autumn and winter, but there are no periods when the condition is entirely absent. The first major waves begin in late September or early October, some two to four weeks after the children return to school. The incidence then rises and falls until Easter when it reaches a low level and remains so throughout the summer.

The epidemiology presents interesting problems. It is known, for instance, that if some degree of stability of population is reached as on a cruise or expedition, then colds die out, even in fierce winter weather, until contact is made once again with a fresh community.

Thus Paul and Freise (1933) found that the people of Spitzbergen are almost free of colds during the winter when they are isolated from the rest of the world, even though this is the time of minimum temperature. Within a few days of the arrival of the first ship in

the spring colds break out and spread rapidly. Similarly Arctic explorers are free of colds until they return home.

The influence of age upon the clinical course is important to bear in mind. The condition in healthy adults is nothing more than an annoying inconvenience. In chronic chest invalids the "common cold" may leave a path of havoc in its wake. In infants and the aged (who incidentally rarely exhibit the usual symptoms) a cold may be potentially dangerous, leading to descending and adjacent spread. Little can be said on therapy for there are no specific measures available. There are nevertheless a hundred and one homely remedies to relieve symptoms.

Acute Febrile Catarrh

It is thought by some that it should be possible to separate from the common colds a group where the systemic reaction is more severe with fever and more pronounced general malaise; this is termed by some "febrile catarrh" and by others "acute respiratory disease." Although nasal symptoms are present they do not constitute the presenting feature as in the common cold. Lower tract symptoms predominate—a dry irritating cough with retrosternal soreness, the throat is frequently sore and the voice hoarse. The fauces, on inspection, are reddened and there is usually a grey mucoid exudate which should be differentiated from the yellow-white follicles of the "strep." throat. The acute stage lasts three to five days and then a slow recovery ensues.

Complications are rare, but in 10% of cases at Fort Bragg in U.S.A. (Commission for Acute Respiratory Diseases, 1947) routine X-Rays of the chest revealed abnormalities which cleared rapidly and spontaneously.

Whether this syndrome is a separate clinical entity or whether it is in fact a non-specific response to more than one causal agent is impossible to say until further progress has been made in the identification and isolation of viruses. Stuart-Harris *et al.* (1938) and Dingle (1948) believe that this is a separate entity, others such as Spence *et al.* (1954) label it as "bronchitis."

Acute Febrile Sore Throats

This common clinical group, consisting as it does of patients who present with a complaint of a severe sore throat and fever, overlaps to a certain extent the previous group. Even excluding those cases where the sore throat is accompanied by coryza and cough we are still left with a large number of cases.

Investigation of these leads to their subdivision into three groups.

- (i) Those where haemolytic streptococci can be grown from a throat swab.
- (ii) Those where no pathogens can be grown from a throat swab, but only commensals.

- (iii) Cases due to other specific organisms such as those of Vincent's angina, fungi (*Candida albicans*) and diphtheria or where the throat infection is merely part of a general systemic disorder such as glandular fever, agranulocytic angina or leukaemia.

In my practice, of 100 consecutive cases the incidence of these groups was as follows:—

Haemolytic strep.	...	...	...	...	64%
No pathogens grown	...	...	...	...	30%
Miscellaneous (herpangina 2, thrush 1, Vincent's 2, glandular fever 1)	...	...	...	...	6%
					<hr/> 100% <hr/>

Dingle (1948) states that in his experience only 50% of acute sore throats are streptococcal.

Aetiological grouping of this kind is of importance because specific treatment may be necessary in certain instances.

The following points are of diagnostic value :—

Mode of onset and severity of illness. In the streptococcal cases the onset is usually very sudden with severe constitutional upset, whilst in the "non-specific" group the onset is more gradual and the patient does not appear so ill.

Appearance of throat. The "strep throat" is a really true tonsillitis, the inflammation being more or less confined to the tonsillar fossae, which are red and swollen with a superficial yellow white exudate. The cervical glands are tender and palpable. The "non-specific" throat gives the appearance of a more generalised inflammation involving the soft palate and pharyngeal walls as well as the tonsils. The exudate is mucoid and grey in colour and can be easily wiped off the surface of the tonsils. The glands are not usually enlarged.

In Vincent's angina the characteristic appearance is of one or two ulcers in the tonsillar tissues and often extending to some depth. The ulcer base is composed of necrotic debris and slough with an unpleasant taste and smell. The systemic reaction varies, usually there is little in the way of general upset. Herpangina, a virus infection, appears to be increasing in frequency and occurs as discrete ulcers, greyish in colour with a thin red edge. It occurs chiefly in children in the summer months.

Other features. It is particularly important in any case which is not settling within a week to consider more serious causes such as

leukaemia, glandular fever or agranulocytosis and for their diagnosis further investigations are essential.

Management

In deciding on the appropriate treatment three considerations are of importance—(a) a knowledge of the natural course of the disease, (b) the possibility of any serious complications and (c) the availability of any specific remedies.

If a clinical diagnosis of a “non-specific” sore throat due to viral or commensal organisms, is made, then it should be realised that there are no specific measures available and that the condition should settle within four to five days, palliative measures only being required.

The problem is different in the case of the “strep.” throat. The patient when first seen is often moderately ill with a high fever and malaise. It should be appreciated however that the natural course of this condition is towards a spontaneous cure within four days without the use of any specific measures, and there is also no doubt that streptococcal infections to-day as a whole do not seem to be as virulent as they were twenty years ago. In healthy children and adults, who can afford a week off work, no specific measures are indicated unless the degree of illness is really great.

Any person with a history of rheumatic fever or in unhealthy patients a different situation exists and the condition can be rapidly controlled with penicillin. I have found that a single injection of a large dose of 800,000 units—600,000 procaine and 200,000 crystalline, will clear the condition within forty-eight hours.

It is noticeable that no mention has been made of the use of oral penicillin or the sulphonamides. I feel that when penicillin is indicated then the parenteral route is the only suitable one, and with regard to the sulphonamides the general trends seem to suggest that they are not really effective in the treatment of the acute sore throats (Anderson, 1952).

Catarrhal Children

This group is a clinical one rather than an aetiological one, in fact there are almost certainly a multiplicity of possible causes. The condition is of especial importance to the general practitioner and also to the ear, nose and throat surgeon and paediatrician; Kempton (1954) states that it accounts for one-fifth of attendances at paediatric outpatients.

The term “catarrhal children” is not an ideal one, but is satisfactory in many respects in that the main features of this condition are symptoms and signs resulting from a “catarrhal” state of the respiratory tract, especially of the upper regions—thus, we see children with nasal catarrh and obstruction; with persistent and irritating cough; and we also see these same children with attacks of fever, otitis media and acute chest infections.

A more detailed account is warranted because of the many problems in the management of these children and their parents.

It is convenient to divide these children into three groups:—

(I) from infancy till the age of three ; (II) from three till eight ; and (III) the over eight-year-olds.

GROUP I. *From birth till the age of three* acute coryzal episodes are extremely common. Spence *et al.* found that in their “ 1,000 Families ” 94% had had some such episode, varying from a “ running nose ” to a “ severe cold ” in the first year of life. In two-thirds of these there was clear evidence of a source of infection, in the vast majority it was a member of the family.

These acute episodes tend to clear up spontaneously within two or three weeks, but recurrences are not unusual. In some the “ cold goes on to the chest ” producing various degrees of disorder from a mild wheezy chest to a fulminating laryngo-tracheo-bronchitis, the latter is fortunately rare.

GROUP II. *Between the ages of three and eight* a different pattern is apparent. In households where there is an older brother or sister at school the onset of this phase is earlier than in the only or eldest child. In the latter this stage develops soon after starting school and in the younger child around two to three years of age.

Following an acute coryzal episode, instead of the symptoms clearing up in a matter of two to three weeks, nasal discharge, which is invariably thick and muco-purulent, persists and an irritating cough becomes prominent, especially at night. Mouth breathing follows the obvious nasal obstruction. These symptoms often continue throughout the winter and the parents become very distressed by it all. The children however look in reasonably good health. This pattern, which is often repeated for two or even more winters, is at times complicated by the already mentioned ear and chest complications. Management is often difficult and trying. A certain proportion undoubtedly have post-nasal obstruction due to enlarged adenoids which may require removal if complications, especially aural, occur. It is on the other hand most important to realise that if the parents are patient, and always assuming that the child is in good health otherwise, this condition will settle on its own with no radical measures being undertaken. The time taken for this spontaneous resolution is usually two or three winters. If symptoms commence early at say three then by the age of five, the winters will not be awaited with parental anxiety. If symptoms commence with school attendance at the age of five, then it will be seven or eight before the child is clear.

It appears possible that it takes this period of time for the young child to develop some resistance or immunity to the causal agents. What has just been postulated does not mean that adenoidectomy

has no place in treatment or that no treatment is necessary, but it is a plea for a more accurate understanding of the natural course of this condition.

GROUP III. *After the age of eight* children seem to enter a phase where "colds" are infrequent and when they come are relatively mild and quickly shaken off.

It has already been stated that the aetiology of this group is almost certainly multiple and it is appropriate now to consider briefly some aspects of possible causation.

Two main causes are *infective* and *allergic*. The latter can occur, but it must be an uncommon cause of the catarrhal child. Follow up of these children to adult life only rarely reveals any allergic manifestations.

Infection would seem to be much the commonest cause. This is supported by the purulent nasal discharge, the pyrexial episodes and the other infective episodes in the ears and chest support this contention. If we are agreed on the infective pathology it is next important to consider the source of infection. In children, two sources at once are obvious—the home and school. We all know of families where recurring infective episodes of the upper respiratory tract are common and in these it is important to search and treat a possible source of chronic infection in one of the adults, e.g. in the sinuses, tonsils or lungs. We can do little about the infection from the nursery school, but the parents should be prepared to keep the child home at intervals during the first two winters.

It is known that the lymphatic system is in a natural state of hypertrophy between the ages of four and twelve and the lymphatic nodes in the upper respiratory tract will take part in this enlargement. It is not surprising that the adenoids and tonsils are enlarged but whether this enlargement is the result or cause of infection or merely incidental to it, is uncertain. We need to enquire further into this and general practice is the place to undertake further studies into this field.

Conclusions and Summary

In a S.E. England urban practice it has been found that infections of the upper respiratory tract account for at least 15% of all attendances in any year, the majority occurring in the winter months.

If the age distribution of the frequency of these conditions is examined then it will be seen that it is the under ten-year-olds in whom the conditions are most common. Whether this is a true or an apparent age distribution is uncertain, it may well be that mothers bring their children for advice more readily than they would seek it for themselves.

Although these conditions are so common there is much to be learnt about them. We need to know more of the differing clinical

types, of methods of prevention and prophylaxis and of reliable methods of treatment.

In this paper four clinical groups have been delineated—the common cold, acute febrile catarrh, acute sore throats and catarrhal children.

The first two groups are considered to be separable by some observers but this is a difficult clinical task as the symptoms and signs are similar in both.

The acute sore throats present a common clinical group. It is surprising how many are non-streptococcal. These cases, both specific and non-specific, are relatively mild illnesses which in the vast majority of instances will settle spontaneously without the use of specific drugs, such as the sulphonamides and penicillin. A valuable investigation would be to determine whether in fact these specific drugs are really necessary in the treatment of this condition and in many other minor infections seen in general practice. My own feelings are that we are using these potent drugs unnecessarily in many cases. We seem to have forgotten that the natural tendency for many of the infections that we see is to settle relatively quickly and quietly as a result of the natural body defences.

Catarrhal children are every general practitioner's headache. Their frequency is well known. Relatively little has been published on the natural history of this condition. It seems to be most common in the early school days between the ages of five and eight, and it is my personal impression that the majority will settle if left alone without surgical interference. This group undoubtedly contains a number of different aetiological groups, some are the result of recurrent infections in the home and others are probably connected with an allergic diathesis—more studies into these varied aspects are necessary.

In conclusion, this paper has shown the need for further work to be undertaken in this field and we in the College have the organisation by means of which this may be carried out.

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