THE EPIDEMIOLOGY OF RESPIRATORY INFECTIONS

(Common Cold, Tonsilitis, Sore Throat)
etc.

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The respiratory system is one of the greatest, if not the greatest, channels by means of which communicable diseases are spread. In the classification of diseases which are spread by means of the respiratory system are to be found such maladies as Influenza, Tuberculosis, Diphtheria, Pneumonia, Cerebro-spinal Meningitis, Measles, Scarlet Fever, Smallpox, Whooping Cough, Poliomyelitis, Mumps, Tonsilitis, Septic Sore Throat, and others. To consider each of these conditions separately, from an epidemiological standpoint, would require more space than is permitted in a descriptive article of limited scope; for this reason no mention is made of the epidemiology of those diseases which are thoroughly understood and clear-cut from a Public Health point of view. The common, but less understood conditions of common cold, sore throat (septic), tonsilitis, sinusitis, etc. will be considered in more detail.

Until within recent years the importance of the common cold, and its associated maladies, was considered rather trifling, but of late this attitude has changed considerably, and it is now realized that a common cold, though it is a mild affair in most cases, is just as serious as one of the so-called serious communicable diseases, in view of the far-reaching consequences which may accompany and follow it. What is said regarding the common cold may be said also for tonsilitis, septic sore throat, and sinusitis. All are similar in many respects, though varying in others.

These nasopharyngeal conditions bear a somewhat indirect importance in sanitation. The conditions themselves are so trifling,

in most instances, that vigorous individuals do not allow them to hamper their routine of life; consequently promiscuous association affords an ideal mode of spreading the infections. It is not strange to find a common cold infecting families, schools, business offices, and instituting small epidemics. With the lowered efficiency resulting, the economic loss yearly is great, but more serious sanitary results follow. Aside from the predisposing effect of the infection of the nasopharynx, the indiscriminate scattering of the discharges occurs to an unusual degree, and with this, an indiscriminate interchange of pathogenic organisms occurs. With this state of affairs the carrier condition increases, and the incidence of disease mounts.

The pathology of these conditions is not at all definite, but consists in congestion, and the associated changes seen in any inflammation.

The etiology of common colds, tonsilitis, sinusitis, etc. has long been a moot question. Not considering the inflammatory conditions of the nasopharynx which appear due to chemical irritants, and the result of anaphylactic phenomena, the usual infections met with are the result of one or both of two factors: (1) A specific causative agent, (2) various environmental or constitutional changes. Usually the infection is a local manifestation of the activity of one or more organisms, upon which the local environment exerts considerable effect.

The entrance to the nose, in health, is swarming with bacteria, but the flora of the nasal cavities is exceedingly sparse, due to the defences established by the ciliated epithelium, the trickling of lachrymal and mucous secretions, the inhibitory action of the mucus, and phagocytosis. On the other hand, the crypts of the tonsils, and the pharyngeal mucosa folds, are known to have an abundant flora, even

including many potentially pathogenic organisms. In disease, however, those cavities which are normally relatively free of bacteria acquire an abundant flora, and the flora in other locations increases in addition, until the nasopharynx literally swarms with bacteria.

Of recent years another additional factor in the etiology of this type of nasopharyngeal diseases has been established. A filterable virus is known to cause a well defined clinical entity which falls in this group. Still another factor is the role of chilling of the body areas, locally or generally, with attending vasomotor changes, and consequent changes in the local or general resistance of the host.

To summarize the etiological factors of these nasopharyngeal diseases, it appears that three chief groups of factors are involved: (1) A filterable virus, (2) a heterogenous group of pure and mixed infections of the nose, pharynx, tonsils, etc., with any one of a number of bacteria capable of acting as causative agents, under appropriate circumstances, (3) Various environmental changes, resulting in a local or general change in the resistance of the individual.

Of the numerous bacteria capable of instituting these nasopharyngeal conditions, the direct relation of some has been definitely established. In this class fall the conditions resulting from the activity of the pneumococcus, streptococci, B. rhinitis, Friedlander's bacillus, and B. influenzae. The role of other organisms, while not yet definitely proven, is very strongly suggestive of their involvement. In this category are the diseases with which are associated M. catarrhalis, B. septus, M. paratetragenous, and Staph. aureus. There is little doubt that some others as well cannot be definitely excluded.

Wide variations in virulence exist between types of organisms, and between the same organisms at different times. Some organ-

isms cause infections in epidemic proportions, nearly or quite independent of accessory factors; others exist as harmless saprophytes upon the mucous membranes, causing infection only when the local or general resistance of their host is lowered, by some exciting factor.

The control of these diseases is an extremely difficult problem, because of the involvement of the etiological factors, and because of the attitude of the public towards the diseases. There appears to be a vicious circle in regard to these diseases, and where to interrupt the circle is somewhat of a problem. It is not practical to apply the same general measures of epidemiological control to these diseases that may be instituted in controlling an epidemic of say diphtheria.

Ideally, the method of control would be to institute the following measures:

(1) Organize in anticipation of an epidemic, large or small, well in advance, and in as much detail as is necessary.

(2) Attack the disease early; insist on an early diagnosis, with early adequate treatment.

(3) Regard diseased persons as the greatest danger, and direct and obvious channels of infection rather than things, and remote or mysterious channels.

(4) Search for the source of the infection. This includes the usual sanitary inspection of milk, food, etc., and a periodic examination of individuals, even if apparently healthy.

(5) Isolation of infected individuals while sources of communication. This has a good psychic effect, and teaches the policy of avoiding crowds.

(6) Use proven methods of artificial immunization, but where not possible, use every practical method to control the condition.

(7) Educate the public. This is the most difficult, but most satisfactory way of controlling these diseases.

As practical measures, many of those listed above are not of value, in the present state of the public mind. There is a crying need for education of the public, and plenty of it. In this campaign the seriousness of secondary complications to the individual should be stressed, and also the value of the practice of greater cleanliness and more strict personal hygiene. Temporary segragation of persons with a cold, tonsilitis, sore throat, etc. should be insisted upon, and likewise there should be a strict prohibition of sneezing, coughing, and spitting, kissing, etc. Handkerchiefs should be burned or sterilized. Public amusements, theatres, lectures, and all crowds, should be strenuously avoided, at least until the excretory stage of the malady is past. It is well nigh impossible to detect and control all the carriers, but by a judicious use of the measures outlined their menace may be somewhat lessened.

These so-called minor respiratory infections are serious conditions, and as such should be placed prominently before the public; however, until public apathy is a thing of the past it seems that these conditions we shall always have with us, in spite of any preventive measures adopted.

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