räumen durch günstige Plazierung der Häuser hingewiesen. Der Architekt hat es oft in der Hand, die besonders lärmempfindlichen Räume vom Straßenlärm abzuwenden, ohne dadurch andere gesundheitshygienische Grundsätze zu vernachlässigen.

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Concepts in the Prevention of Respiratory Diseases

By *Kurt Schwarz*[1]

Summary

Measures to control respiratory diseases are assessed. Immunological and epidemiological preventive aspects are discussed. Some of their merits and limitations are presented in relation to the concept that a critical level of infection determines diseases.

Zusammenfassung

Es werden Methoden zur Erfassung respiratorischer Krankheiten besprochen. Immunologische und epidemiologische Aspekte werden diskutiert. Positive Ergebnisse und Einschränkungen dieser Erhebungen werden zu dem Konzept in Beziehung gebracht, wonach die Krankheit erst bei einem gewissen Grade der Infektion zum Ausbruch kommt.

In England and Wales 18% (99,620) of deaths during 1961 were due to diseases of the respiratory tract [1]. Although a large number (22,810) were due to cancer and might be considered "unavoidable" a large proportion of these deaths could have been avoided if modern concepts had been applied. The morbidity toll is far in excess of these mortality figures.

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Dingle and *Feller* (1956) [2] found that 66% of all illness episodes were of respiratory origin so that the importance of respiratory disorders cannot really be overstated.

The host-parasite relationship is now established in the aetiology of disease. In the case of the respiratory tract some special peculiarities of anatomy, physiology and pathology exist which require consideration. Local defense mechanisms comprise the secretions, ciliary action and cough all of which under abnormal circumstances are liable to aggravate a disease process. Secretions, when purulent, may inactivate and bind antibiotics due to the presence of D.N.A. Thickened secretions may block a bronchus causing segmental collapse and predisposing towards infection. Ciliary action may spread bacteria so that a local lesion may become generalised throughout the lung. Similarly excessive coughing may produce local emphysema and sometimes bronchiectasis.

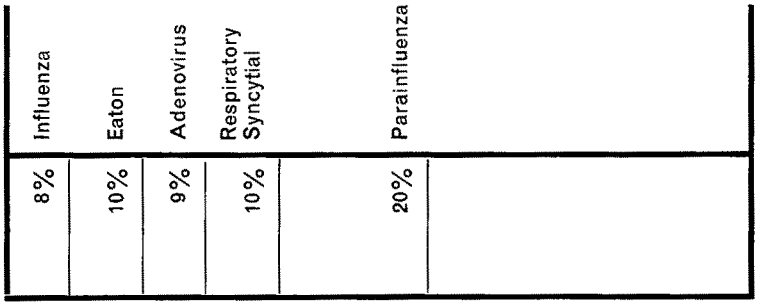
Immunologically there are many problems. The dissociation between cellular and humoral antibodies is pronounced in the lungs, and the continual desquamation of the epithelium only adds to the complexity. The role of vitamin A in converting squamous epithelium into mucus secreting columnar epithelium and its possible association with resistance to infection is still uncertain [3]. Interferon, which may be considered the recovery or resistance process of virus infection, has a limited protective ability. Although available in purified form its use is still uncertain. Even more complex are the antenatal factors which have been shown to influence immunity. Blood group: the failure of the placental transfer of $19S\gamma'$ macroglobulins increases the susceptibility of the newborn to Gram negative organisms and the staphylococcus. In a possibly similar manner abnormal haemoglobins prevent the satisfactory immunisation reponse in neonates.

It is natural that under these circumstances the assessment of immunisation procedures is a difficult one. Both active (living and inactivated vaccines) and passive means have been tried to improve host resistance. Varying routes–intranasal, conjuctival sac, insufflation, aerosol inhalation and parenteral methods–have all given comparable antibody response and immunity. Although intrapulmonary influenza immunisation gave a higher antibody response than other routes [4].

Influenza has been the object of intense research in recent years, but even now the situation is far from satisfactory [5]. The efficiency of a suitable vaccine is 42–75% [6] and cannot be used if egg allergy exists. In addition unless the correct strain is incorporated the resistance to disease may be lowered rather than enhanced [7]. Nevertheless an influenza vaccine (comprising numerous strains) is suggested for use in infancy so that a form of background immunity may be established which non-specifically might ensure a greater efficiency in dealing with subsequent infection [8]. The current practice in influenza is that

only key personnel and special groups are immunised. Sufferers from cardio-respiratory disorders and other chronic ailments, pregnant women and the elderly, these are the ones at risk from influenza.

During inter-epidemic periods there are an increasing number of viruses known to cause disease requiring hospital admission. The illustration below gives an approximate idea of their relative importance:



Selected closed communities i. e. military forces can successfully be immunised against adenovirus infection but with a 2–3 % incidence in the general population vaccines are of limited use. Multiple infections pose additional difficulties. Blunderbuss immunisation, incorporating all possible viruses, is then the only possible way unless a prevalent virus is known. Unfortunately by the time this virus is identified and a vaccine prepared, the wave of infection has passed. Sometimes the vaccine is as bad as the disease viz. measles. Virus vaccines are still very unsatisfactory. Special groups at risk may be immunised but routine immunisation is not advisable in many cases.

Bacterial diseases are somewhat different. Vaccines in pertussis and tuberculosis are very efficient but even their use is now modified. In a satisfactorily immunised host the disease is milder and complications less, but infection is not prevented and as in whooping cough, carriers are frequent. In tuberculosis B.C.G. is secondary to other preventive measures (excluding developing countries) now that the incidence of tuberculosis is on the decline. Many countries wonder whether its routine use is justified or whether it should only be reserved for contacts. It is now held that when 10 % of school leavers are tuberculin positive it is time to stop B.C.G. as a routine and direct all efforts to epidemiological control measures.

Epidemiological Control

Knowledge of the natural history of a disease determines the methods used. In diseases spread via the respiratory tract whether measles, smallpox, tubercu-

losis or influenza, the primary consideration is control of the infected host. Isolation and quarantine are reviewed in the light of our knowledge of infectivity. Streptococcal infections of the throat for example, penicillin is so efficient that no organisms are recoverable after 48 hours–isolation for scarlet fever is therefore no longer necessary after the streptococci have been eradicated. Sometimes this form of control is not as easy. In influenza or the common cold, when patients will not remain at home because they consider their condition "mild". Then personal hygiene can materially reduce dissemination of virus by control of cough, sneeze and other routes of droplet and droplet nuclei spread. These infected persons should also not be permitted to work with children or visit old people who are so susceptible to infection.

Control is complicated by subclinical infection and infectivity prior to overt disease. In this field there have been encouraging results. Morning and evening oral temperatures may be used. The isolation of anyone with a temperature of 99 F. or above reduces infection [9]. Combining this method with a selective cough depressant influenced the number of cases of mumps in a school for handicapped children [10]. Similar results have been obtained recently in controlling streptococcal infections.

Attempts have been made to interrupt routes of infection by air sterilization using ultra violet light or aerosols. Although reducing the incidence of respiratory disease these methods are only of use in selected spheres i.e. infectious disease hospital or paediatric units. Attention to the sterility of vehicles of infection i.e. eating and drinking utensils, also help to reduce the infectivity of the environment.

There appears to be a critical level of infectivity which determines whether the dose is large enough to cause disease. Any method which reduces bacterial or viral contamination of our surroundings will aid our natural resistance to infection.

Fungal infections also merit mention if only because of their increased incidence. This may be due to the use of antibiotics. On the other hand spores may contaminate packing material and in this way pathogenic fungi may be introduced from abroad. Parcels have been the only link where disease due to fungi, not normally found there, has occurred. The increased use of culture methods for fungi has clarified a number of clinical problems, i.e. sporotrichosis.

Allergy may be due to a number of agents including fungi and organisms. This may manifest as asthma, hay fever or systemic disease. Desensitization has achieved many a cure especially where moulds cause allergic respiratory symptoms in industry. Similarly seasonal desensitization has contributed to the control of allergic rhinitis and some forms of asthma. Bacterial desensitization has had variable results although the sensitization effects are well known i.e. the tuberculin test, rheumatic fever. The allergic syndrome is complex espe-

cially where both antenatal and postnatal factors are concerned. What is clearer, is complicating infection.

One of our biggest problems today is the insistance of some medical and non-medical opinion that some diseases are mild and harmless. Some presumptions have turned out dangers of the first importance i.e. rubella and congenital abnormalities. Influenza is only considered important when of epidemic proportions. People are permitted to enter paediatric and geriatric units suffering from infections capable of causing death in the patients they are visiting. In view of the limitations of immunisation our attention must be directed to epidemiological control methods in the prevention of respiratory diseases.

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Über das finnische Abortgesetz und die diesbezüglichen Auffassungen finnischer Mütter

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Zusammenfassung

Nach dem finnischen Abortgesetz genügt die soziale Indikation für eine legale Schwangerschaftsunterbrechung nicht, und

Summary

According to the Finish laws a social indication is not sufficient for an artificial legal interruption, and such a measure can in no

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