EFFICACY OF TAO (TRIACETYLATED OLEANDOMYCIN) IN ASTHMATIC NASAL STAPHYLOCOCCUS CARRIERS

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During the past two decades, staphylococcal infection in hospitalised patients has gradually emerged as one of our serious and distressing therapeutic problems. Recurrent outbreaks of staphylococcal disease are not uncommon in nursery units where new-born infants are congregated. Important surgical procedures are occasionally compromised by serious staphylococcal sepsis. Staphylococcal infections are a common terminal event in the course of debilitating illness which requires long hospital care. Characteristic symptomatologies are well recognised and documented. Rhinologic manifestations are of particular interest to Rhinologists. The nature and severity of the disease are extremely variable from person to person. This fact undoubtedly is due to the interplay of a number of variables on the part of the organism and of the host.

Staphylococci are most readily isolated from the anterior nares of carriers. Most hospital personnelle become carriers at one time or another, but the degree of colonisation varies appreciably. The use of a series of lysogenic bacteriophages allows more precise identification of individual strains. Phage typing permits more precise analysis of the epidemiology of infections and also the carrier state. Between 40 and 50% of coagulase positive organisms can be characterised by different lysis patterns using phages currently employed. Three large phage groups are recognised with overlapping of individual strains within each group. In general, hospital strains which are antibiotic resistant fall into phage group three. Staphylococci isolated from non-hospitalised people are more usually strains of phage group two or one. Antibiotic resistant strains are least common is group two.

Occasional carriers probably are not true hosts, but merely harbor briefly the strain most prevalent in the environment. These carriers exhibit different phage type strains at different times. Persistent carriers consistently yield the same phage type strain. Some carriers spread large numbers of microorganisms into the environment, and may be referred to as shedders or disseminating carriers.

The colonisation of persistent carriers is best considered an infection even if asymptomatic. Monitoring and regular nasal cultures may assist in the detection of disseminators, but there are no clinical features which distinguish them from the non-disseminators. Carriers occasionaly lose their strain after they are removed from the environment in which it was acquired. Local nasal antibiotic preparations containing neomycin, methicillin, and bacitracin and other agents when used frequently sometimes effect a change in flora, but

usually nasal micro-organisms reappear when the repressive agents are discontinued. Systemic antibacterial therapy may be added to the regimen, but the end results have not been too impressive.

In many instances, certain strains of the micro-organisms are resistant to antibiotics (more recently methicillin), thus placing us back to the days of Lister when we were entirely dependent upon hygienic methods to combat this type of infection.

It has been observed that a staphylococcus derived substance, a toxin, has a potentiating effect in escalating the pathogenicity of a number of other multibacterial infections, hence a staphylococcal product may be one of a number of known infecting promoting agents, which physically coat other bacteria and thereby render them less susceptible to the natural defense mechanism of the host.

An approach to the problem of treating recurrent staphylococcal infections involves the theory of suppressing the emergence of new mutant and the role of L-form.

Recent studies have shown that the regimen requires administration of two antibiotics, TAO and tetracycline being used. The choice of drugs in our experiment, first tetracycline then TAO, then the combination of the two were used. Tetracycline is more active against the cellular protoplasm and thus effectively destroys the L-forms, while the TAO is primarily active at the cell-wall and therefore effective in inhibiting the parent coccal cells.

Staphylococcal infection is often latent or subclinical, when it may be diagnosed though asymptomatic, as was the case in our pilot study of twenty patients with five being considered as nasal carriers. When resistance is lowered severe infections may be manifested. The possibility of a superimposed infection is always to be considered in the chronic asthmatic. This clinical study consisted of two groups of ten patients each. Each group was placed for a one-week period on placebo (for wash-out) followed by two weeks on either TAO or Placebo after which each group was crossed over. In order to elucidate whether such carriers may influence the results of drug therapy, pre- and post-study cultures were performed on all patients and pulmonary function tests of these patients who had been diagnosed as nasal staphyococca carriers.

All patients including the five pre-investigation staphylococcus carriers, yielded negative cultures at the end of the study.

Analysis of the measurements for airway resistances (RA) and the thoracic gas volume (V_{tg}) in these patients did not indicate that the presence of staphylococcus, as a carrier, influenced these parameters.

Furthermore, no patient (either pre- or post-investigation) showed evidence of pleuropneumonia-like organisms (PPLO) or L-forms.

A previous study of the effect of TAO upon chronic asthmatics suggested that TAO had an effect other then antimicrobial, in that significant improvement was noted in 8 of 21 patients.

It is not appropriate to compare the study with our findings. Firstly, the pulmonary function tests did not include the measurement of airway resistance. Secondly, there was no phage typing of strains involved. Both studies' results comprised a small number of patients only, even were the phage type

series to have been comparable, it would require a large study for any statistical significance.

The results from this study suggested that the necessity for clearing asthmatic patients of such carrier organisms prior to a clinical investigation of a pharmacologic agent (such as a bronchodilator) is not crucial, though certainly it would be beneficial. It is particularly important to bear in mind that it is essential to eradicate pathogens whenever encountered, being especially true when such microbial pathogens may pose a real threat to life — as in the geriatric, the gravely ill, and the pediatric patient.

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