

Introduction

A few years ago, the respiratory tract diseases in pigs, in particular enzootic pneumonia as growth-reducing factor, seemed to meet with still greater interest than today. On the one hand, this is surely due to the fact that other infections and growth-reducing diseases have gained significance while the situation of respiratory tract diseases has slightly improved due to practiced hygiene, prophylaxis and SPF-programmes. On the other hand, the shifting of therapeutic interest could be based on the experience that administration of pharmaceuticals - essentially that of antimicrobial substances - frequently had only a slight or no success at all. In the following is presented a substance which - due to its effect on the symptomatic of chronic respiratory diseases as well as the possible improvement of the respiratory function and the ventilation conditions in the total nasotracheobronchial tract - may be suitable as alternative to conventional therapeutic measures.

Pharmacology

N-AB 365, Clenbuterol (Cl.) is a 4-amino-(tert.-butylamino)-methyl-3,5-dichloro-benzylalcohol hydrochloride. The substance shows clearly several activities of a different nature, all more or less interesting for the treatment of respiratory diseases. The classic property of this group of substances is their pronounced

1. broncholytic resp. bronchodilating activity
The β_2 -stimulation released by Cl. is comparable to that released by isoprenaline. The very distinct
2. secretolytic activity is even stronger than in distillation products of turpentine. Cl. stimulates the lysosomal system of the bronchial mucosa, whereby the secretion is loosened intracellularly and due to the intensified production transported away more easily. A further factor cooperating with the secretolysis and furthering expectoration is the
3. activation of the ciliary function. This enhancement of the ciliary movement is expressed by the increase in frequency of the latter as well as by acceleration of the removal of mucus. Tough, stagnant secretion is loosened more easily from the walls of bronchi and bronchioles and removed more quickly. Furthermore, Cl. exercises a distinct
4. protective action upon the mast cells. In allergic, pathogenic mechanisms the substance impedes even in broncholytically effective doses the release of mediator substances. At first was proved by experiment the inhibition of histamine liberation as consequence of mast cell degranulation under the influence of the antigen-antibody reaction in the dextran and egg albumin edema in the rat. Later could be reached absence of symptoms in man in the acetylcholine and histamine provocation test under Cl.-protection. Beside by these pharmacologic qualities, Cl. distinguishes itself by its pharmacokinetic properties. It possesses an
5. extremely good oral resorbability amounting to approx. 100% while it is independent from the species and a
6. long duration of action. This is caused by

the special metabolic stability of the Cl.-molecule and the fact that it is bound extremely strongly to the β_2 -receptors of the muscle fibers of the bronchi. Thus it is possible to reach with Cl. a much longer duration of action than with comparable substances.

Clinic

Cl. is used in human medicine and also - very successfully - in veterinary medicine. Pulmonary function tests in treated horses, in which were proved dropping of the interpleural pressure, decrease of resistance, relieving of respiration and increase of the vital capacity, objectify the positive clinical impression in the same way as do blood gas analyses, which resulted in clearly more favourable O_2 -values and endoscopic controls in increased secretolysis and improved expectoration. It is interesting that a considerable decrease of respiration was also found in clinically healthy animals.

First orienting test-treatments in pigs with enzootic pneumonia (EP) point out that, above all, the symptom cough can be influenced favourably by Cl.. Moreover, there exists the clear impression that the increasing well-being of the treated animals manifests itself by enhanced appetite, favourable development of their weight and decreasing losses. Presently running pulmonary function tests are meant to objectify the Cl.-activity in the pig. Profitability tests proving clearly the usefulness for the animal owner, are presently running in various European countries and in Mexico.

Conclusions

The EP in pigs shows a pathological as well as clinical picture similar to that of the bronchitis in humans. Therefore, it seems to be obvious that a concept of treatment successful in human medicine, i.e. the use of β_2 -adrenergics, is equally indicated in pigs. Beside a decrease of nasal resistance by vasoconstriction, one may count on a function-maintaining resp. improving effect in case of an early administration, which supports the intrapulmonary cleaning processes and influences the ventilation conditions favourably. As the degree of clinical symptoms in a herd and the frequency of consolidated pulmonary lesions can be seen in a context and as there is as well no doubt about a relation between the portion of consolidated lungs of "pigs for slaughter" of a herd and economic losses, there is no doubt about the positive effect on profitability of an effective symptomatic treatment.

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