

mykosen

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The Problem of Medico-Mycologically Underdeveloped Countries

III. On the fate of persons suffering of fungus diseases in areas or countries where the physicians lack training in medical mycology, or where there is a want of adequately equipped laboratories to permit satisfactory diagnoses

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During the last decades the share of mycology within the frames of general microbiology has increased at a dizzying pace. A large sector of industry all over the world now works with technological processes using fungi for fermenting beverages, compounding foodstuffs, producing different kinds of organic matters, such as organic acids, antibiotics, etc. However, analogously with this increasing knowledge of the usefulness of fungi, our knowledge of the harm done by them has increased, too.

Summings up, completed during the last few years from medico-mycological statistics, show that actually one fifth, or 20 per cent of the whole of mankind is suffering from fungus infections (5). Supposing that one half of the affected individuals have contracted some superficial, or so-called cutaneous affection, there still remain 10 per cent with deep mycoses, of which at least a further half, or 5 per cent of the whole population, constitute a group being, besides other medical tests, also in potential need of a more penetrating examination by means of mycological histo-pathological and/or immunoserological investigations. Thereby it must be taken into consideration that a mycotic infection need by no means be caused by a known primary or secondary pathogenic fungus, but that, in fact, also a large number of saprophytes have, under favourable conditions, been discovered to have the capacity to attack living things, man or animal. As a remarkable example for the preceding statement may be given a recent observation by EMMONS on candidiasis-like symptoms caused in members of a debilitated Indian family in Arizona by such an otherwise innocent yeast as *Saccharomyces cerevisiae* (1).

Furthermore, to the above infections have also to be added the numerous cases of allergies caused by air-borne fungal conidia, as well as the more and more increasing number of recognized cases of mycotoxicoses in consequence of consumption of mould-deteriorated foodstuffs. And last but not least, in possible future microbiological warfare, we also have to consider the use of pathogenic fungi, or rather, what is more credible taking into account present-day knowledge, the use of toxins of fungi, which promise a broader spectrum of action than those yielded by bacteria.

The high percentage of fungus infections in man can be easily explained by the continuous massive exposition of man to fungi during his life-time. Mathematical calculations concerning the amount of fungi on our globe, have yielded that the total weight of the living fungal organisms in soil, or above it, attached to plants, by far exceeds the weight of the bodies of entire mankind (5).

Taking into consideration the high percentage of mycotical infections occurring all over the world, it might at first sight seem paradoxical to a large public that in certain, rather highly developed countries the public health authorities have not yet accepted the idea of the existence of mycology amongst the many other branches of microbiology and, as seen from the medical point of view, the existence in their countries of ailments

in man and animal caused by fungi. Discussions on the subject carried on with the authorities in such countries often take place in a rather strained atmosphere, the authorities for the most part trying to avoid a closer penetration of the problems.

I feel that such behaviour might not seldom be ascribed to some uncertainty on the part of one of the parties, based on the lack of a deeper understanding of the problems. However, we can find a plausible explanation in WIKÉN's words, uttered in his presidential opening speech at the 3rd International Symposium on Yeasts in The Hague in 1969 (13). He said that the microbiologists in countries that have not followed the rapid development in the mycological field, have, so to say, put themselves into the position of a man who is left behind while his horses are running away from him.

Since 1966 it has become more and more evident that there exist countries, not in the least in Europe, where insufficient attention, or almost no attention at all, has been paid to mycotic diseases — the so-called medico-mycologically white spots on the geographical map (7). Those countries are characterized by an insufficiency in, or a total lack of, training their physicians in medical mycology. Moreover, those countries lack medico-mycological laboratories, or at least adequate ones.

In connection with the above, mycologists on the international level have begun to wonder what is actually happening to people suffering of fungus diseases in such countries or areas.

A classical example, elucidating the fate of misjudged cases in general, has been forwarded by SYMMERS (11). A student from California, USA, died at a British hospital of a lung affection, which at the post-mortem proved to have been *coccidioidomycosis*. The physician in charge had, owing to want of experience, not been able to interpret the anamnestic data that the patient had earlier suffered of "Vallery fever", and so no treatment in respect to *coccidioidomycosis* had been applied. There is also another, judging by appearances even more tragical example, given by SYMMERS (12), the tragical effect due to the fact that this incident did not end in death as usual, but in what can rather be regarded as a mutilation of the patient. In a young surgeon who had developed a small, defined tissue density on his right underarm, sarcoma was diagnosed histologically by a pathologist, and the arm was amputated. Several weeks later, when the histological sections came into the hands of a mycologically trained pathologist, the tissue changes could be identified as *histoplasmosis*, an affection that could have been treated without amputation. The harm, however, had already been done.

In order to avoid any misunderstandings, the author would like to point out that the above examples of misjudged cases given by SYMMERS come from a country that has a number of medico-mycological laboratories, several of which are fitted out as reference laboratories. It was owing to the activity of those laboratories that the real diagnoses in the cases mentioned above could be revealed. It might also be appropriate here to mention an example worth while following for other countries. The British Museum has amongst its exponents placed on public view, since the early nineteen sixties also set up an exposition of animal and human pathogenic fungi with explanations on the effects produced by them.

On hand of the above-mentioned, as well as many other similar observations, we can consider the assumption to be justified that in medico-mycologically underdeveloped countries the fungus affections are mistaken for other diseases. On account of their usually chronic character, the mycoses have to be differentiated from other chronic affections,

in the first place from such as tuberculosis, tumours, syphilis, certain blood anomalies, etc. Moreover, taking into consideration the lack of facilities for making adequate diagnoses in such countries, we see that the fungus infected individuals in the underdeveloped areas cannot count with proper ward.

However, leaving alone for a moment the question of the hopeless situation of the fungus infected persons as far as they themselves are concerned, those persons may also constitute a potential danger for other individuals in their surroundings. Although to-day there is little belief in a transmission of deep mycotic diseases by contact from man to man, there still remain other ways for a transmission of the disease. In our modern medical era, e. g., the transplantation of organs has proved to be one of those ways, ending, as a rule, fatally for the recipient (2, 8).

All that uncertainty in respect to mycological problems prevailing in the discussed areas, has there created an atmosphere of suspicion in regard to all that concerns mycology. The mere presence of sick persons suffering of mycoses, whose existence in those countries has been denied by the authorities, has become an embarrassment to the surroundings of the patient, and not least to the officials. In an attempt by everybody to avoid the problems, the word mycology has, actually, become taboo in those areas. Thus, if nothing is done in order to put things right, we are, generally speaking, in the medico-mycologically underdeveloped countries on the best way to make the fungus infected individuals an atomic age counterpart of the medieval lepers.

As a final comment the author would like to add a brief outline of his own experiences in regard to the problems discussed above from 25 years' work in a country with about 400,000 individuals in potential need of a closer medico-mycological examination, but no access to medico-mycologically trained physicians, or an adequately equipped laboratory. The comment may serve as an illustration of the obstacles that medical mycology has still to overcome in some civilized and in other respects well organized countries. Simultaneously it may also serve as an orientation to people who feel that there is something wrong with the treatment of mycology in their surroundings, but do not know where to begin with an analysis of the situation.

As regards the author, the problem has in the first place been a lack of resources to enable him to carry out adequate medico-mycological diagnoses, the governmental laboratory having placed at his disposal only facilities that allow to make diagnoses in a way used at the turn of the century, viz. solely by the cultivation of the causative agent from the pathological samples. No means for an investigation of the pathological properties or a drug-resistency of the isolated agents, or for carrying out immuno-serological tests or histo-pathological examinations have been given, letting alone basic research. However, the clinical material has even in this area been composed of ailments with different kinds of symptoms, although dominated by chronic changes, in the first place of the respiratory, but also of the meningo-encephalitic tract. Both local as well as imported cases have had to be considered.

In the local cases the causative agents have at first hand been suspected to be moulds, such as *Aspergillus fumigatus*, or species of the *Mucoraceae*, belonging mainly to the Genera of *Absidia*, *Mucor* or *Rhizopus*. There have been years during which *Asp. fumigatus* has been isolated from specimens originating from the respiratory tract of about up to 10 per cent of the samples received. In cases of meningo-encephalitis mostly *Cryptococcus neoformans* has been suspected of being the cause of the changes. The imported

cases have consisted of people returning from foreign countries. At first hand they have been young people who have studied abroad, not least in the USA, but also technicians and businessmen, as well as members of the peace corps or UN troupes stationed in exotic countries.

In order to get the necessary laboratory facilities, so as to beyond the cultivation of the fungi also to be able to carry out the for a medico-mycological diagnosis necessary histo-pathological and immuno-serological investigations, the author in 1967 submitted a request to fit out the governmental mycological laboratory adequately. The answer to that request was negative. The rejection was made without any suggestion of an investigation into the state of matters. The motivation for the rejection was that the way of making mycological diagnoses at the laboratory was satisfactory, and there was, at the time being, no need to worry about fungus diseases.

The Board of Health had based its decision on the opinion of four experts, two physicians and two bacteriologists. Only one of the physicians, an allergologist, had shown a positive attitude in regard to the question. The other, a heart specialist, admitted that he was not capable of giving a verdict on all the problems presented. The bacteriologists were both of the opinion that the diagnoses were made in an adequate way, and that there did not exist any mycoses of importance in the country.

The author, not being satisfied with the answer received, screened the special literature for reports by clinicians and pathologists on the occurrence of mycoses in the area in question, including the neighbouring countries, as well as discussed the problems with physicians from the areas in question, who had acquired knowledge of mycoses during their sejours abroad.

He found that in the larger area, viz. that embracing even the neighbouring countries, there had actually been encountered the bulk of the up to-day known more than two dozen mycoses. Exceptions were only *black piedra*, *South American blastomycosis*, *rhinosporidiosis* and certain rare infections by exotic moulds. Furthermore, interesting facts about the hidden existence of mycoses in those countries were revealed. There was, e. g., from one of the neighbouring countries a report on 5 cases of Aspergillomata, 4 of which had been treated from 6 months to 2 years as non-bacillary tuberculosis. The fifth case had been regarded as a benign tumor for 18 years (3). In the same country, 161 soldiers who had visited endemic areas in the USA were examined for mycoses. 20 of them showed a positive Coccidioidin reaction, and 7 of them had chest X-ray changes. From 2 with the X-ray changes the causative, *Coccidioides immitis*, could be grown (6).

As to *cryptococcosis*, the disease proved not to be uncommon in the area. From another of the neighbouring countries, inter alia, a case of a solitary defined cryptococcal abscess of the brain, having the appearance of a tumor, was described (4). Moreover, the causative fungus, *Cryptococcus neoformans*, has in the country under discussion been isolated from pigeon droppings, and the author himself has found it there in soil as well as water. In a third of the neighbouring countries, in the course of the last few decades, *chromoblastomycosis* has been discovered to exist (9, 10). Undiagnosed, such cases used to pass as cutaneous tuberculosis, and at least one of the cases had been treated for a considerable time by surgeons as a chronically bacteria-infected *Ulcus cruris*.

Here the question arises why in the country under discussion less mycoses have been diagnosed than in the surrounding ones. Have the administrative frontiers really had

some kind of protective effect against the infection, or is the reason merely that there have been fewer possibilities in the country for making adequate mycological diagnoses? I should not like to state by that that the laboratories in the neighbouring countries were better outfitted. However, the physicians there, having caught the idea of a possible occurrence of mycotic diseases in their country, had, if it proved necessary, approached foreign laboratories for help with diagnosing the cases.

Thus, taking into consideration the state of development of medical mycology in general in our space age, we can still find sharp contrasts regarding the development in certain countries. Whereas in some countries the scientists also try to inform the wider public of the dangers represented by the pathogenic fungi, in others not even the physicians are informed of the existence of mycotic diseases. Therefore there still remains the question what has to be done on the international level, to point out to the Public Health Authorities in the medico-mycologically underdeveloped countries the necessity of instructing their physicians as well as their veterinarians in this field, and, last but not least, of establishing adequately equipped medico-mycological laboratories in order to alleviate the sufferings of the fungus infected individuals in the areas they are responsible for.

References

1. EMMONS, C. W.: Pathology and therapeutics of yeast diseases. 3rd Intern. Sympos. on Yeasts, Delft — The Hague, 2—6 June 1969.
2. HOOD, A. B., INGLIS, F. G., LOWENSTEIN, L., DOSSETOR, J. B. & MACCLEAN, L. D.: Histoplasmosis and thrombocytopenic purpura: transmission by renal homotransplantation. *Cand. med. Ass. J.*, **93**, 587—592, 1965.
3. KROHN, J. & HALVORSEN, J. H.: Aspergillosis of the lung in ankylosing spondylitis. *Scand. J. Resp. Dis., Suppl. Nr. 63*, 131—132, 1968.
4. MALMROS, R. & MUNCH-PETERSEN, C. J.: A case of granulomatous torulosis in the brain. *Acta Psych. et Neurol. Scand.*, **26**, 191—197, 1951.
5. MÜLLER, E. & LOEFFLER, W.: *Mykologie. Grundriß für Naturwissenschaftler und Mediziner.* Georg Thieme Verlag, Stuttgart, 1968. Pp. 302.
6. NATVIG, H. & FRAAS, M.: Coccidioidomycosis imported to Norway. (*Coccidioidomycosis imported to Norway*). *Tidskr. Norske Laegeforen.*, **87**, 2037—2042; 2054, 1967.
7. PALDROK, H.: The problem of medico-mycologically underdeveloped countries. *Mykosen*, **11**, 379—382, 1968.
8. PALDROK, H.: The problem of medico-mycologically underdeveloped countries, II. On the tasks and organization of a medico-mycological central- or reference laboratory. *Id.*, **12**, 61—66, 1969.
9. PUTKONEN, T.: Die Chromomykose in Finnland. *Hautarzt*, **17**, 507—509, 1966.
10. SONCK, C. E.: Zur Kasuistik der Chromoblastomykose. Vier Fälle aus Finnland. *Arch. klin. exp. Derm.*, **209**, 223—242, 1959.
11. SYMMERS, W. ST. C.: Cases of Coccidioidomycosis seen in Britain. *Proc. 2nd Coccidioidomycosis Sympos., Phoenix, Arizona.* December 8—10, 1965.
12. SYMMERS, W. ST. C.: Histoplasmosis in non-endemic areas. 8th Intern. Congr. Tropic. Medic. and Malaria, Teheran, 7—15 September 1968.
13. WILKÉN, T. O.: Opening speech of the chairman of the organizing committee. 3rd Intern. Sympos. on Yeasts, Delft — The Hague, 2—6 June 1969.

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