



SCIENTIFIC GROUP ON INTESTINAL PROTOZOAN
AND HELMINTHIC INFECTIONS

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DEFINITIONS, CLASSIFICATION AND TERMINOLOGY

by

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The intestinal tract of man is a biotope for many parasitizing animals which complete there the essential, reproductive part of their life cycle. The species of parasites proposed for discussion here are listed as follows:

Entamoeba histolytica and E. polecki
Dientamoeba fragilis
Giardia lamblia
Isospora belli
Sarcocystis suihominis and S. boviominis
Balantidium coli;

Clonorchis sinensis
Opisthorchis felinus and O. viverrini
Fasciolopsis buski;

Diphyllobothrium latum
Taenia solium and T. saginata
Hymenolepis nana;

Ascaris lumbricoides
Ancylostoma duodenale and A. ceylonicum
Necator americanus
Trichuris trichiura
Strongyloides stercoralis
Trichostrongylus spp.
Capillaria philippinensis
Morerastrongylus (Angiostrongylus) costaricensis
Enterobius vermicularis
Anisakis sp. and Phocanema sp.

The list does not include several species of protozoan animals inhabiting the human intestinal tract but not being regarded as pathogenic, such as Entamoeba gingivalis, Iodamoeba bütschli, Endolimax nana, Enteromonas hominis, Chilomastix mesnili, Trichomonas hominis. Sporadic reports on symptomatic infections with Chilomastix mesnili need further confirmation.

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Schistosoma mansoni and S. japonicum infections are an important public health problem and are dealt with separately in the recent WHO Technical Report series No.643, Geneva, 1980, and in various publications of the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases. The list does not include several of the trematode and cestode infections for which man is an accidental host, such as Fasciola, Echinostoma, Heterophyes, Metagonimus, Dicrocoelium, Gastrodiscoides spp., as well as Dipylidium caninum, Hymenolepis diminuta, Raillietina, Inermicapsifer and Bertiella spp.

No mention is made in the list either of several species of tissue parasites for which the gut is only an entry to the human organism, e.g. Toxocara sp., Toxascaris leonina, Paragonimus sp., Echinococcus spp., Angiostrongylus cantonensis. Trichinella spiralis live their adult reproductive stages in the human gut but can be regarded rather as a human tissue parasite as most of the pathology of trichinellosis is related to the muscle phase of invasion.

The list may not be complete, for two reasons: firstly, some human intestinal parasitic infections have been diagnosed only recently, such as intestinal capillariasis (C. philippinensis) and intestinal angiostrongyliasis (Moreraststrongylus costaricensis), and the taxonomic position and life cycle of some other human parasites such as Strongyloides in Papua New Guinea and Taenia in the Philippines still remain unclear. Secondly, man is exposed not only to specific parasites but also to many non-specific parasites, e.g. the strobilocercus of Taenia taeniaformis which still may be accidentally diagnosed in humans and may be incorporated in the list of parasites found in man.

The nomenclature of some intestinal parasites and infections is a matter of controversy. For example, Giardia lamblia is well established in the United States as a synonym for Giardia intestinalis (Lambl, 1859); a synonym used in eastern Europe is Lamblia intestinalis. Trichuris as a generic name is more commonly used than the proper name - Trichocephalus. Taeniarhynchus saginata is a synonym used in the Russian literature for Taenia saginata.

In general, it is proposed that the well-established terms (Giardia lamblia, Taenia saginata, Trichuris trichiura) be used, although they may be in conflict with formal taxonomy.

The same is true for the names of infections, e.g. giardiasis, taeniasis, trichuriasis. However, to avoid misunderstanding, T. solium taeniasis and T. saginata taeniasis are used for differentiating between T. solium and T. saginata infection; ancylostomiasis is used for A. duodenale infection, A. ceylonicum ancylostomiasis for A. ceylonicum infection and necatoriasis for Necator americanus infection.

As there is not always a clear-cut difference between infection and disease the same terms are used for both, e.g. amoebiasis is used for the asymptomatic (carrier) infection and for the disease. However, it is recommended that clinicians use more detailed descriptions in individual cases, i.e. amoebic dysentery, amoebic non-dysenteric colitis, amoebic appendicitis, amoebic liver abscess, asymptomatic amoebiasis. Only in this way can any misunderstanding with regard to the patient's actual condition be avoided.

The intestinal parasites in man can be classified by several criteria: e.g. taxonomic, clinical, epidemiological and that of public health importance.

Only a few of the human intestinal parasites belong to phyla other than Protozoa and Helminths, i.e. to Acanthocephala (Macracanthorhynchus hirudinaceus and Moniliformis moniliformis infections) or to Arthropoda (intestinal myiasis). In the past, several Protozoan and Helminthic infections were dealt with separately (e.g. amoebiasis, soil-transmitted helminths) as they required the protozoological or helminthological knowledge and techniques, which are different. Nowadays, with an increased tendency to attack the common problems (malnutrition, diarrhoea, water supply and sanitation) rather than particular diseases, the intestinal infections can be discussed as a whole complex since they have many similarities in clinical pathology and epidemiology.

In clinical textbooks, human intestinal infections are usually grouped according to their localization in the host and symptomatology. There are three classic localizations of the intestinal parasites: the small intestine, the large intestine and the liver. Some parasites occupy the same 'niche' in the intestinal tract, e.g. Strongyloides female worms deep in the mucosa, Giardia trophozoites close to the enterocytes. Some change their position along the gut according to the host feeding habits, i.e. tapeworms, or because of immunological responses being more actively expressed in the upper parts of the jejunum, i.e. Trichinella adult worms passing down in the later stages of the infection. There is evidence also that some parasites, such as Giardia and Trichinella, change their position in relation to the villi, from one separated from the villous surface by a layer of mucous to another intimate one within the villus. These localizations are frequently a reflection of the host immunological status or of previous pathological changes in the gut.

Although many intestinal parasites cause a chronic infection, slowly debilitating the host, some may produce an acute condition, which needs intensive medical care or surgery. In the last category are fulminating amoebiasis, amoebic liver abscess, different complications of ascariasis and perforation of the gut by Anisakis-like nematodes. The variety of the clinical pathology causes the intestinal parasitic infections to fall into the care of general practitioners, paediatricians, and surgeons as well as the specialists of various narrow disciplines such as gastroenterologists, nutritionists, haematologists, hepatologists, etc.

The intestinal protozoa and helminths are transmitted mainly by dirty hands and contaminated food and water. A few infective stages such as the hookworm and strongyloides larvae may enter the human body actively. For intestinal Protozoa the most likely route of transmission is the faecal-oral one. Most nematodes parasitizing man are soil-transmitted. But some Protozoa such as Sarcocystis sp. and many intestinal Cestoda and Trematoda are transmitted in various animals being used by man as food. Therefore intestinal parasites can spread in different ways and measures for their control need different approaches.

The global public health importance of intestinal parasitic diseases depends on two factors: the severity of clinical pathology and the prevalence. Amoebiasis, giardiasis, ascariasis, hookworm infections and strongyloidiasis are of major importance, being both widely distributed and potentially highly pathogenic or even fatal. Some others, such as intestinal capillariasis, clonorchiasis, opisthorchiasis and diphylobothriasis, may be a cause of severe clinical pathology but are of more local importance as their distribution is limited to some regions only. Finally, there are infections which are widely distributed in the world but rarely pathogenic, such as enterobiasis.

With such a diversity of etiological factors, clinical pathology, ways of transmission and control measures, the discussion at the Scientific Group meeting should concentrate on some major aspects only:

- (1) the factors influencing pathogenicity, mortality and morbidity in man and changing an infection into a disease;
- (2) the variables responsible for prevalence and intensity of infection, and
- (3) principles of epidemiological surveillance, prevention and control.

It is expected that the public health and socio-economic importance, as well as recommendations for future research and control measures, will emerge from this meeting.