

IMPORTANT NEMATODE INFECTIONS IN INDONESIA

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ABSTRACT

At least 13 species of intestinal nematodes and 4 species of blood and tissue nematodes have been reported infecting man in Indonesia. Five species of intestinal nematodes are very common and highly prevalent, especially in the rural areas and slums of the big cities. Those species are *Ascaris lumbricoides*, *Necator americanus*, *Ancylostoma duodenale*, *Trichuris trichiura* and *Oxyuris vermicularis*, while *Strongyloides stercoralis* is disappearing. The prevalence of the soil transmitted helminths differs from place to place, depending on many factors such as the type of soil, human behaviour etc. Three species of lymph dwelling filarial worms are known to be endemic. the urban *Wuchereria bancrofti* is low endemic in Jakarta and a few other cities along the north coast of Java, with *Culex* incriminated as vector, high endemicity is found in Irian Jaya, where Anopheline mosquitoes act as vectors. *Brugia malayi* is widely distributed and is still highly endemic in many areas. The zoonotic type is mainly endemic in swampy areas, and has many species of *Mansonia* mosquitoes as vectors. *B. timori* so far has been found only in the south eastern part of the archipelago and has *Anopheles barbirostris* as vector.

Human infections with animal parasites have been diagnosed properly only when adult stages were found either in autopsies or removed tissues. Cases of infections with *A. caninum*, *A. braziliense*, *A. ceylanicum*, *Trichostrongylus colubriformis*, *T. axei* and *Oesophagostomum apioistomum* have been described from autopsies, while infections with *Gnathostoma spinigerum* have been reported from removed tissues. Infections with the larval stages such as VLM, eosinophylic meningitis, occult filariasis and other could only be suspected, since the diagnosis was extremely difficult and based on the finding and identification of the parasite. Many cases of creeping eruption which might be caused by the larval stages of *A. caninum* and *A. braziliense* and *Strongyloides stercoralis* were diagnosed only clinically. Also diagnosed clinically were occult filariasis which was caused by animal filarial worms, and eosinophylic meningitis caused by *Angiostrongylus cantonensis*.

While *Toxocara canis* and *T. cati* are prevalent in dogs and cats, *Anisakis* in marine fish, no cases of Visceral larva migrans and anisakiasis have been reported in man in Indonesia.

INTRODUCTION

In Indonesia, parasitic infections in general are decreasing. However, parasitic infections are still important, especially in rural areas and slums of the big cities. At least 18 Nematodes have been reported infecting

man in Indonesia, but only 8 species are prevalent, widely distributed and cause public health problems. Other Nematodes, especially the non human parasites, may infect man, and cause clinical symptoms, which are sometimes difficult to diagnose, and therefore not easy to determine the treatment. Be-

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parasites may give different symptoms than in the natural host. Moreover, the parasites themselves, as erratic parasites are hidden in unusual tissues and difficult to be found with the usual technics.

Soil transmitted helminths

The most prevalent are the soil transmitted helminths, consisting of *Ascaris lumbricoides*, *Trichuris trichiura*, *Nector americanus* and *Ancylostoma duodenale*. These parasites are widely distributed and may be found in all stool surveys. Before the implementation of the control programme, very high prevalences are common. In many areas, one species may be predominant, but in other areas high prevalences of all soil transmitted helminths may be found, while in areas with good sanitary conditions, mostly involving the higher socio economic group, low prevalences are common. *Ascaris lumbricoides* may be found in almost 100% of the inhabitants of certain areas. Especially high prevalences have been reported in children. In a slum area in Jakarta, follow up studies of babies born in that area, showed that 100% of the children have been infected with *A. lumbricoides*, when they have reached their second year of life^{1,2}. In Kresek, West Java, Clarke *et al* (1973) reported *A. lumbricoides* in 90%, *T. trichiura* in 91% and hook worm infection in 67% of the stools examined. In Kalimantan, Masbar and Purnomo reported an infection of *A. lumbricoides* in 80%, hookworm infection in 82% and *Trichuris trichiura* in 78% in a stool surveys, Margono made a summary on the results of stool surveys, showed high prevalences in all provinces surveyed except East Nusa Tenggara with only 10% *A. lumbricoides*, 35% *T. trichiura* and 1% hookworm infection. High prevalences of all the 3 species of soil transmitted

helminths were found in the provinces of West Java, Yogyakarta, Bali, West Nusa Tenggara and South Sulawesi. In 1985, the CDC of the Department of Health reported overall lower figures, which may be due to the control programmes. Another possibility is that the data from the Department of health include the whole population, while Margono's data were results from certain groups.

The clinical symptoms of these infections are usually not severe, but very often disturbing, and when calculated in terms of loss of working hours because of weakness, fever, abdominal pain and diarrhoea. The economic loss caused by these infections may be considerable. Moreover the clinical symptoms are usually not typical and not easy to diagnose. More severe are the unusual symptoms of complications of soil transmitted helminthic infections. Halimun *et al*⁵ reported 40 cases of complications of *Ascaris* infection as intestinal obstruction and acute appendicitis, which had occurred in the years 1973-1975. Hookworm infections may cause severe anemia with heart failure as result, while *Trichuris* infection may cause severe anemia and malnutrition due to dysentery syndrome. Clinical symptoms caused by the larval stages are even more difficult to diagnose. Loeffler's syndrome caused by the larvae of *Ascaris* has only been suspected and never confirmed in Indonesia. The same happens with ground itch caused by the larvae of hookworms. Infections with the non human soil transmitted helminths are difficult to confirm, because of the unusual situation. *Toxocara canis* and *T. cati* are prevalent in dogs and cats in Indonesia^{6,7}, but visceral larva migrans caused by the larvae have never been diagnosed.

Some of the soil transmitted helminths have been decreasing very much. *Stron-*

gyloides stercoralis, which Sri Oemijati⁸ in 1956 found 9.4% positives among hospital patients and 16.3% in autopsies, is now rarely found in surveys, and also in autopsies. Lie Kian Joe in 1947⁹ found in autopsies in Jakarta, 47 % positive with *Trichostrongylus colubroformis* and *T. axei*. These worms are now also very rarely found. Moreover these 3 species are very small worms, and need special technics to diagnose.

Many species of animal nematodes have been discovered and identified because of the findings of these worms in autopsies and clinical cases. *Ancylostoma caninum*, *A. braziliense*, *A. ceylanicum* and *Acanthocephala* have been discovered in autopsies¹⁰ while *Gnathostoma spinigerum* have been discovered in clinical cases^{11,12}.

Filariasis

Filariasis still constitutes a major health problem in Indonesia. The infection is widely distributed, but the prevalences and intensities of the infection differ from place to place. In areas where the Filariasis Control Programme has not yet reached, high prevalences could be found. Sri Oemijati *et al* in the years 1980-1984, found among the native people on the island of Buru an Mf rate of 70% and a disease rate of 47%¹³. Although it may be found in urban areas, filariasis is mostly a problem in the rural areas, affecting the people of the low socio-economic group. It is also a lowland disease but may be found in some of the hilly areas. So far 3 species of at least 5 epidemiologically different types have been identified. *Wuchereria bancrofti* is prevalent both in urban and rural areas. The urban type is low endemic in some urban areas as Jakarta and Semarang, and has as vector the urban mosquito *Culex quinquefasciatus*. The rural

W. bancrofti has a wide distribution and is highly endemic in Irian Jaya. Many species of mosquitoes have been incriminated as vector. As *An. farauti*, *An. subpictus*, *An. punctulatus*, *Ae. Kochi* and *paCx. bitaeniorrhynchus* been described as vectors¹⁴.

Brugia malayi is strictly rural in occurrence, and may be found in swampy areas and rice fields. The zoophylic type¹⁵, which formerly was described as the subperiodic type, recently showed that the periodicity is not strictly subperiodic, but may also show no periodicity at all. This type which may infect animals, is mostly found in swampy areas and has as vectors many species of *Mansonia* mosquitoes.

The anthropophylic type, formerly described as the periodic type has a more restricted distribution than the zoophylic type. This parasite is mostly found in rice field areas and has as vector mostly *An. barbirostris*.

Brugia timori is a parasite which has been described as a new species¹⁶ has been found only in the south eastern part of the Archipelago, in the Provinces of Nusa Tenggara Timur, consisting of Timor, Rote, Flores and others; the provinces of East Timor and the southern part of the Province of Maluku (Moleccas). This parasite was first reported from East Timor, then was still a Portuguese colony¹⁷. The findings in Indonesia was first reported by Sri Oemijati and Lim Kiat Tjoan in 1966¹⁸, followed by other reports as results of more detailed studies. So far no reservoir hosts have been discovered; as vector *An. barbirostris* have been confirmed.

Many nonhuman filarial worms are prevalent in Indonesia. Among these *B. pahangi* and *W. kalimantani* are the ones resembling the human parasites¹⁹. These parasites may infect man but the diagnosis is difficult to confirm. Clinical symptoms of

occult filariasis were seen occasionally, and treated while no correct diagnosis had been established.

Mostly found as reservoir hosts are the *Presbytis cristatus* and cats.

Angiostrongylus cantonensis

Angiostrongylus cantonensis, the causative agent of eosinophilic meningitis is prevalent in Indonesia, mostly in rats^{20,21}. The parasites have been reported from North Sumatra, South Sumatra, Lampung, West Java, Central Java, North Sulawesi, Central Sulawesi, East Nusa Tenggara²³. The following animals have been reported harbouring the parasites: *Rattus rattus diardi*, *R. exulans*, *R. tiomanicus jalorensis*, *R. lepturus*, *R. norvegica* and *Bandicota indica setifera*. Lim *et al* found in South Sumatra a highest infection rate in *R. tiomanicus* and a lowest infection rate in *R. r. diardi*.

The larvae have been recovered from the landsnail *Achatina fulica* and slugs. So far only two clinical cases of eosinophilic meningitis have been reported from North Sumatra¹³ and one case of ocular *Angiostrongylus* infection from Semarang, Central Java²⁴.

SUMMARY AND CONCLUSIONS

In Indonesia, although parasitic infections are generally decreasing, many parasites still constitute public health problems especially in the rural and slums and suburbs of big cities. Besides the human parasites, many animal parasites have been reported infecting man in Indonesia. The parasites have been found mostly accidentally in autopsies or clinical cases, and later identified based on the study of the morphological features. However, when the parasites are not

discovered, the case will never be diagnosed correctly, or only suspected, based on the clinical symptoms, as occult filariasis, Visceral Larva Migrans, creeping eruption and others. Therefore more sensitive methods need to be developed to be able to make a correct ethiological diagnosis.

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QUESTIONS AND ANSWERS :

1. Question: *Trichostrongylus* sp. and *Strongyloides* decreased in recent years. (why) ?
 Answer : Many parasites have disappeared : may be caused by many factors like sanitation, socio-economic conditions, change of environment, etc.
2. Question: Are there any reports of disseminated strongyloidiasis in immuno-compromised patients?
 Answer : No cases of disseminated S.s. infection were found in Indonesia. Back in 1956 I have found one case with auto infection showing creeping eruption.