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.timbori* 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 apiostomum* have been desribed 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 migrains 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 para-
sites themselves, as erratic parasites are hid-
ren in unusual tissues and difficult to be
found with the usual technics.

Soil transmitted helminths

The most prevalent are the soil trans-
mitted 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 trans-
mitted helminths may be found, while in areas
with good sanitary conditions, mostly involv-
ing the higher socio economic group, low
prevalences are common. Ascaris lumbrico-
oides 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%, hook-
worm infection in 82% and Trichuris trichiura in 78% in a stool surveys, Margono
made a summary on the results of stool sur-
veys, showed high prevalences in all provin-
ces surveyed except East Nusa Tenggara with
only 10% A. lumbricoides, 35% T. trichiura
and 1% hookworm infection. High prevalen-
ces 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 work-
ing hours because of weakness, fever, abdom-
al pain and diarrhoea. The economic
loss caused by these infections may be con-
siderable. Moreover the clinical symptoms
are usually not typical and not easy to diag-
nose. More severe are the unusual symptoms
of complications of soil transmitted helmin-
thetic infections. Halimun et al\(^{5}\) reported 40
cases of complications of Ascaris infection as
intestinal obstruction and acute appendicities,
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. In-
fections 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 In-
donesia\(^{6,7}\), 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 Oemijati 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 1947 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 techniques 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 autopsies while Gnathostoma spinigerum have been discovered in clinical cases.

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 disaease 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 socioeconomic 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 quinguefasciatus. 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 vectors.

Brugia malayi is strictly rural in occurrence, and may be found in swampy areas and rice fields. The zoophylic type, 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 then 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 species 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 colony. The findings in Indonesia was first reported by Sri Oemijati and Lim Kiat Tjoan in 1966, 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 parasites. 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 resevoir hosts are the *Presbytis cristatus* and cats.

**Angiostrongylus cantonensis**

Angiostrongylus cantonensis, the causative agent of eosinophylic 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 Tenggara.23 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 eosinophylic 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.

**REFERENCES**


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.