Cases and Developments of Filariasis Disease and Its Caused in Indonesia

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Abstract

Filariasis is a disease caused by filarial worms which are transmitted by mosquito vectors. Filariasis may cause thickening of blood vessels and swollen lymph nodes. Almost all cases of filariasis are not detected until complications occur. Early detection can be done through the examination of peripheral blood regularly. The most commonly found Filariasis cases in Indonesia are caused by a Brugia malayi . Based on the report of 2009, the highest number of filariasis cases were in the provinces of Aceh, East Nusa Tenggara, and Papua, and the lowest were found in the provinces of Bali, Maluku and North Sulawesi. Microfilariae rate indicates the prevalence of filariasis in that area. The highest numbers of microfilariae in Indonesia were found in West Papua, Gorontalo and Papua provinces. Filariasis is a major disadvantage in terms of economic, labor productivity and it can cause lifelong disability. One of the efforts made in the global filariasis elimination program is the mass administration of prevention drug in which the WHO set a minimum target of 85%. In Indonesia, for the year 2005 - 2009 is still at the level of 28 to 59.48 % . The Ministry of Health has planned a program to eliminate filariasis starting in 2014 and continue to have the acceleration program filariasis elimination untill 2020.

Key words: filariasis, microfilaria level, Indonesia

Background

Filariasis (elephantiasis disease) is caused by filarial worms, which are transmitted by a mosquito vector. Some species of filarial worms that can be found in Indonesia, among others: Wuchereria bancrofti, Brugia malayi, and Brugia timori. Of the three species, the species of Brugia malayi filariasis cases are most commonly found in Indonesia.

Microfilariae infect lymphoid tissue (lymph nodes). Microfilariae in the human body will grow into adult worms and settled in the lymph tissue that causes swelling of the legs and genital organs (Profil Kesehatan Indonesia, 2010: 53; Pusat Data & Surveilans Epidemiologi, 2010; Nurjana, 2009:33).

According to WHO, there are about 1.3 billion people in the world, covering more than 83 countries, who at risk of contracting filariasis, and more than 60% are in Southeast Asia, and it is estimated that more than 120 million people are infected, and 43 million people already showing clinical symptoms of swelling of the leg or arm (lymphoedema) or other body part. Filariasis is widespread, especially in rural areas and can infect all age groups from children to adults, both men and women (Direktorat P2B2 Ditjen PP & PL Kemenkes, 2010:1).

In Indonesia, filariasis disease remains a serious health problem. It is estimated that by 2009 there were more than 125 million people at risk of contracting filariasis, spread over 401 districts / cities with a number of chronic cases reach 11.914 cases in which microfilaria prevalence of about 19% or the equivalent of 40 million inhabitants. This is the cumulative number of patients with newly discovered old and new patients (Profil Kesehatan Indonesia, 2010:53; Direktorat P2B2 Ditjen PP & PL Kemenkes, 2010:1).

Microfilariae and Vector

In 1889, Haga and Van Eecke first report on the presence of filariasis in Indonesia.

There are 3 types of species of filarial worms that cause filariasis disease found in Indonesia,

and the most widely spread is Brugia malayi. While Brugia timori only found in eastern Indonesia, including the islands of Timor, Flores, Rote, Alor and several small islands in East Nusa Tenggara, and Wuchereria brancrofti found in Java, Bali, West Nusa Tenggara and Papua (Direktorat P2B2 Ditjen PP & PL Kemenkes, 2010:3).

Humans can be infected with microfilariae by mosquito bites. Currently in Indonesia has identified as many as 23 species of mosquitoes belonging to the genus 5 which can act as vectors of filariasis, among others: Mansonia, Anopheles, Culex, Aedes and Armigeres. The main vectors for W. bancrofti type commonly found in rural areas of Papua, namely An. farauti and An. punctulatus. While W. bancrofti urban type found in large cities is Cx. quinquefasciatus. B. malayi Mansonia vectors are found in coastal and lowland areas (Depkes RI, 1999). Only species of filarial worms B. malayi and non-periodic subperiodik that have host reservoir, such as monkeys, apes, cats, etc. (Nurjana, 2009:35-36).

Female filarial worms will produce larvae called microfilaria, which will migrate into the circulatory system. Elephantiasis or better known as elephantiasis disease is mainly caused by the adult worms live in the lymph channels, and can damage and clog the lymph fluid, causing swelling in the legs and arms. Adult worms in the lymph nodes may survive for 5-7 years (Direktorat P2B2 Ditjen PP & PL Kemenkes, 2010:1).

Filariasis Infection

Humans are infected through mosquito bites containing larval microfilariae. The larvae develop in the body and become infective mosquitoes for 1-2 weeks. The development of the filarial worm larvae begin entry of microfilariae from the mosquito to the human body to become adult worms takes 3 to 36 months (Riyanto, 2010:1).

A healthy person can be infected with microfilaria worms after mosquito bites hundreds to thousands of times. In addition, there is also the influence of other factors such as the presence of other diseases, fatigue or malnutrition. Although the person has a strong body condition, repeated bites of microfilariae infected mosquito may cause immunity.

Similarly, the people who live in endemic areas will be more resistant than those who happened to be traveling to endemic areas of filariasis.

According to Riyanto (2010:1), filariasis disease may be initiated by the onset of inflammation of the lymph nodes due to channel through which the adult filarial worms, causing dilation and damage to the gland. Dilation of lymph nodes causing many plasma fluid out of blood vessels into tissues and skin, as well as damage it and cause thickening of the blood vessels, and lymph nodes become winding and swollen.

Typically, early filariasis infection difficult to detect until complications occur in the legs and genitals. To overcome this, peripheral blood examination needs to be done periodically. Blood can be taken from the index finger, and have it examined.

Early symptoms may include high fever, chills, muscle aches, and headache. Signs of the disease vary widely, can be bloody urine and the presence of protein in the urine or urinating pus in the morning. In addition, other symptoms may include high fever, inflammation of the lymph glands, as well as localized swelling, and inflammation of the veins. When infected with W. Bancrofti, the inflammation can occur in the testicles in men (Riyanto, 2010:1).

Filariasis Cases in Indonesia

In Indonesia, cases of filariasis is still quite high and showed an increase from year to year. This is indicated by the discovery of a number of cases in the last 5 years. Based on the data obtained from Pusat Data & Surveilans Epidemiologi Kementerian Kesehatan RI (2010), clinical cases from 2005 to 2009 respectively were 8.243 cases, 10.427 cases, 11.473 cases, 11.699 cases and 11.914 cases. Filariasis cases were found in 33 provinces in Indonesia.

If the number of patients to be reviewed by the province for the year 2009, the highest number of filariasis cases found in the Province of Nanggroe Aceh Darussalam (2.359 people), followed by East Nusa Tenggara (1.730 people) and Papua (1.158 people). While the lowest case can be found in Bali (18 people), North Maluku (27 people), and North Sulawesi (30 people). Furthermore, if observed by the District, the district with the highest number of cases is North Aceh (1.353 cases), Manokwari (667 cases), and Mappi (652 cases). However, there are also districts / cities that are not found clinical cases of

filariasis. Of the 495 districts / cities, there are as many as 356 (71.9%) districts / cities are included in filariasis endemic regions, and 139 districts / cities are not endemic filariasis. (Pusat Data & Surveilans Epidemiologi, 2010:2-3).

Management of Filariasis

According to Pusat Data dan Surveilans Epidemiologi Kementerian Kesehatan RI (2010:5), there are two indicators that can be used to assess the effectiveness of the control of filariasis in Indonesia, namely the percentage of the district / city become endemic, and the percentage of clinical cases (lymphoedema and hydrocele) are treated per year> 90%. The data obtained show that the number of cases are treated in the year 2005 was 1.461 people from 8423 people (17.62%), while in 2009, there were 4.766 people out of 11.914 people (40%). When viewed from the indicator, the cases of filariasis treated has not yet reach 90% so it may be said that filariasis control programs have not been effective.

One of the efforts made in the global filariasis elimination program is the administration of the mass drug for prevention (POMP). Mass drug prevention programs conducted in Indonesia in 2005-2009 was 28 to 59.48%. While the WHO set a minimum target of 85% in order to break the chain of transmission. Although in the last 5 years there was an increase POMP, but the percentage of program being implemented is still far below the WHO target (Pusat Data & Surveilans Epidemiologi Kementerian Kesehatan RI, 2010:5-6).

Epidemiology of Filariasis

Microfilariae level shows the prevalence of filariasis microfilariae in a given area as compared to the number of people who are checked. Based on data obtained from Subdit Filariasis Ditjen PP & PL on 2009, the highest microfilaria rate in Indonesia is West Papua (12.8%), Gorontalo (9.24%), Papua (6.6%), and West Sumatra (6.39%). Average numbers of microfilariae are determined by the district surveyed. In this case, not all districts in the provinces surveyed. While filariasis endemic districts in Western Indonesia are 61%, Midsection are 84 %, and Eastern Indonesia are 74%. A district is said to endemic if the numbers of microfilariae> 1% (Wahyono, 2010:10-11).

Filariasis cases also tend to increase from 2005 to 2009 in the province of Indonesia, which has the highest number of clinical cases in 2009, namely: (1) Nanggroe Aceh Darussalam, (2) East Nusa Tenggara, (3) Papua, (4) Irian Jaya west, (5) Riau, and (6) East Kalimantan.

According to Wahyono (2010:12), to determine the endemic areas are based on survey results indicated by a finger prick endemicity of data distribution is not the same (unidirectional) with the distribution of the number of clinical cases of filariasis in each district / province in which district the number of clinical cases is not followed by many high microfilaria rate. There are several reasons put forward to explain this, among other things: 1) the quality of data on clinical case reports and surveys finger prick was poor because of weaknesses in the way of data collection, 2) different environmental conditions in each district, and 3) risk factors different in each district of the disease filariasis, and 4) host factors (race, ethnicity and genetic) different to suffer clinical filariasis.

Clinical cases showed indicator of disease, while the number of microfilaria an indicator of disease transmission in a region. To perform filariasis elimination, then the number of microfilaria as indicator of the success of the program. In contrast, chronic case management program must consider the number of clinical cases.

Diagnosis of Filariasis

Microfilariae into the peripheral blood at night, so that blood sampling is done at night at 20:00. Blood taken from the finger as much as 20-60 mL will be placed on the glass slide for blood preparations made thick and thin blood preparations, with dye staining. In addition to microscopic examination, serologic tests can also be conducted to W. bancrofti antigen. However, for Brugia sp antigen test is not yet available, but it can be done serologic antibody (Supali, 2010:20).

Elephantiasis can lead to permanent disability for chronic sufferers. Clinical symptoms of elephantiasis can be found on the feet and hands, as well as in the male genitalia (scrotum) and female (vulva and breasts). Type filarial worms can be distinguished based on clinical symptoms arise. If there is swelling of the entire leg or hand or genitals, then the cause is W. bancrofti. Whereas if swelling occurs only below the knee or below the elbow, and is not found on the genitals,

then the cause is Brugia sp (Supali, 2010:21).

Filariasis Disease Control

Global elimination program launched by WHO in eliminating the causes of public health problems caused by filariasis in 2020. This program aims to reduce the prevalence of filariasis infection and break the chain of transmission. The program is implemented through two pillars of activity, namely: (1) Mass drug prevention program (POMP) to all residents of the district / city of endemic filariasis with DEC 6 mg / kg combined with Albendazole 400 mg once a year for 5 years, which aims to break the chain of transmission, and (2) The treatment of clinical cases of filariasis to prevent and reduce disability (Supali, 2010:22; Profil Kesehatan Indonesia, 2010:100).

Since 2005, the implementation of the unit used in filariasis elimination program is to determine the number of mass drug prevention administered (POMP). If a unit is found filariasis endemic region, the activities performed by the POMP target drug delivery for all residents of the district / city, except for children aged <2 years, pregnant women, people seriously ill, chronic filariasis patients who experience an acute attack, and toddlers with marasmus / kwashiorkor may be delayed treatment. Treatment aims to prevent or reduce disability (Profil Kesehatan Indonesia, 2010:100).

Based on the data obtained from Profil Kesehatan Indonesia (2010:100), filariasis clinical management activities in Indonesia tends to increase. This is indicated by an increase in the number of cases that have been handled where in 2005 there was 17.20% of the cases, in 2006 there were 31.10%, in 2007 there were 29.40%, and in 2008 there was 40.13% of cases, and decreased slightly to 40.00% of cases in 2009 is expected in the next course can be increased to 90% in accordance with the target.

POMP implementation filariasis program in Indonesia has not been efficient and effective because it is based on the district / city, so do not reach the entire population in the region and there is still the risk of infection (reinfection). That is why this program should be directed to the comprehensive plan and covers all endemic in Indonesia (Direktorat P2B2 Ditjen PP & PL Kemenkes, 2010:2). Vector control can be done through the control of chemical and non-chemical control of vectors such as environmental management, biological control and genetic. Chemical control is done with chemicals to kill or inhibit the growth of vectors by spraying insecticides. Vector control through environmental management primarily devoted to agriculture, such as changes in swamps into agricultural land, thereby reducing mosquito breeding sites or cleaning drains. Biological vector control can be done by maintaining predatory fish in waterways (Nurjana, 2009:37-38).

Socioeconomic impact of filariasis in Indonesia

Elephantiasis (elephantiasis disease) is a disease that can be found in the tropics and subtropics. The spread of the disease in Indonesia covers a wide area so that if not taken seriously, it can lead to a decrease in employment productivity and huge economic losses. That is why, the disease is becoming one of the infectious diseases prioritized for elimination. Filariasis elimination program has been launched globally by the WHO since 1999 (Direktorat P2B2 Ditjen PP & PL Kemenkes, 2010:1-2).

Elephantiasis can cause the infected people suffer, causing social and economic impact for the patients and their families. If the disease continues, it will affect the economy and become a burden in the family. In addition, filariasis can cause lifelong disability that affects the economic burden of the people, namely medical expenses (including transportation costs), and productive hours lost due to illness. While the social impact of social activity can be disrupted and discomfort. (Direktorat P2B2 Ditjen PP & PL Kemenkes, 2010:33).

According to estimates by the Ministry of Health of the Republic of Indonesia (2009), if not done filariasis control, the economic losses due to filariasis can reach 43 trillion dollars per year. To reduce this economic burden, it is necessary to move strategically and systematically in order to deal with the spread of filariasis in Indonesia.

Filariasis Elimination Programme Action Plan 2010-2014

The Government of the Republic of Indonesia through the Ministry of Health has planned filariasis elimination program until 2014 and acceleration program will continue

to be pursued until 2020. Filariasis elimination program is an accelerated program begins with the first 5 years starting from the year 2010 to the year 2014 goal of the program is to perform POMP filariasis to all districts / cities that are endemic in eastern Indonesia. POMP implementation considerations filariasis in Eastern Indonesia as a priority due to the high prevalence of microfilaria. As for the districts / cities in Indonesia, West and Central will be increased to 2014 (Direktorat P2B2 Ditjen PP & PL Kemenkes, 2010:18).

There are several strategic filariasis elimination programs which will be implemented during the years 2010 - 2014, among other:

1. Enhancing the role of regional heads and other stakeholders.
2. Strengthening the planning and implementation including preparation of socialization in the community.
3. Ensure availability of drugs and distribution, as well as power operations.
4. Strengthening the implementation of filariasis POMP supported by the system of supervision and implementation of security co-occurring treatment and posttreatment.
5. Improve monitoring and evaluation

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