Analisis Epidemiologi, Entomologi dan Molekuler Kasus Elefantiasis dan Kejadian Filariasis di Jawa Tengah dan Daerah Istimewa Yogyakarta

INTISARI

Latar Belakang. Elefantiasis merupakan penyakit kronis dengan pembesaran organ tubuh yang paling banyak disebabkan oleh filariasis limfatik. Filariasis limfatik di Jawa Tengah disebabkan oleh infeksi cacing *Wuchereria bancrofti* ditularkan oleh nyamuk *Culex quinquefasciatus*. Diagnosis etiologis elefantiasis menjadi masalah di lapangan. Pemeriksaan sediaan darah secara mikroskopis merupakan baku emas diagnosis filariasis, namun sering terjadi kendala. Pemeriksaan alternatif seperti ELISA dan PCR mempunyai sensitivitas dan spesifisitas cukup tinggi. Pemeriksaan PCR juga digunakan untuk evaluasi penularan filariasis dalam bentuk *xenomonitoring*. Keberadaan tempat perkembangbiakan nyamuk, keberadaan hewan ternak berpengaruh terhadap kepadatan nyamuk, yang dapat mempengaruhi kejadian filariasis. Ditemukannya mikrofilaria dalam darah tepi pada pukul 6 pagi, dan di sisi lain nyamuk *Ae. aegypti* mulai aktif menggigit pada pagi hari, menimbulkan pertanyaan apakah *Ae. aegypti* dapat berperan sebagai vektor filariasis. Oleh karena itu penelitian ini bertujuan untuk menganalisis nilai *positive rate* metode pemeriksaan mikroskopis, ELISA dan PCR, menganalisis nilai *vector microfilaria rate, vector infection rate* dan *vector infective rate* nyamuk *Cx. quinquefasciatus*, mengetahui hasil *xenomonitoring* di daerah endemis filariasis, menganalisis keragaman dan kepadatan populasi nyamuk di daerah penelitian, dan menganalisis faktor karakteristik subyek, perilaku subyek dan lingkungannya terhadap kejadian filariasis di Jawa Tengah dan DIY.

Metode. Penelitian ini dirancang dengan desain *cross sectional*. Data diambil di Kabupaten Pekalongan, Demak, Magelang, Sleman dan Bantul. Pemeriksaan dilakukan di laboratorium FKKMK UGM Yogyakarta. Subyek elefantiasis dan non elefantiasis diperiksa fisik dan diambil darah untuk pemeriksaan mikroskopis, ELISA dan PCR. Nyamuk ditangkap malam hari selama 12 jam di dalam rumah dan di luar rumah sampel dengan metode *human landing collection*. Nyamuk diidentifikasi, dilakukan pembedahan untuk mendapatkan mikrofilaria, L1, L2 atau L3 dan dilakukan pemeriksan PCR. Lingkungan diamati keberadaan *breeding place* dan keberadaan kandang. Analisis *positive rate* dengan penghitungan proporsi. Faktor-faktor yang berpengaruh terhadap penularan filariasis dianalisis univariat, bivariat dan multivariat.

Hasil: Ada potensi kejadian filariasis di daerah non endemis filariasis. Tidak ditemukan adanya transmisi pada nyamuk *Cx. quinquefasciatus*, namun ditemukan transmisi pada nyamuk *Ae. aegypti*. Orang yang tinggal serumah dengan penderita elefantiasis mempunyai risiko tertular 6,6 lebih tinggi dibanding orang yang tinggal tidak serumah dengan penderita elefantiasis, dan orang yang tidak aktif minum obat POMP berisiko tertular 6,3 kali lebih besar dibanding orang yang aktif POMP.

Keyword: *Ae. aegypti, Cx. quinquefasciatus*, elefantiasis bancrofti, vektor potensial, *xenomonitoring*

Epidemiological, Entomological and Molecular Analysis of Elefantiasis Cases and Incidence of Filariasis in Central Java and the Special Region of Yogyakarta

ABSTRACT

Background. Elefantiasis is a chronic disease with organ enlargement mostly caused by lymphatic filariasis. Lymphatic filariasis in Central Java was caused by *Wuchereria bancrofti* transmitted by the *Culex quinquefasciatus* mosquito. The diagnosis of elephantiasis was a problem in the field. Microscopic examination was the gold standard for diagnosing filariasis, but it can generated false negatives. Alternative tests such as ELISA and PCR had high sensitivity and specificity. PCR examination was also used to evaluate the new transmission of filariasis in the form of xenomonitoring. The existence of mosquito breeding sites and the presence of farm animals affect the density of mosquitoes, which can affect the incidence of filariasis. Microfilariae were found in peripheral blood at 6 am, and on the other hand, *Ae. aegypti* begins to bite actively in the morning, raising the question of whether *Ae. aegypti* can act as filariasis vector. Therefore, this study aims to analyze the positive rate of microscopic examination, ELISA and PCR methods, analyze the value of vector microfilaria rate, vector infection rate and vector infective rate of *Cx. quinquefasciatus*, knowing the results of xenomonitoring in filariasis endemic areas, analyzing the diversity and density of mosquito populations in the study area, and analyzing the characteristics of the subjects, the behavior of the subjects and their environment against the incidence of filariasis in Central Java and Yogyakarta.

Method. This cross sectional study was taken in Pekalongan, Demak, Magelang, Sleman and Bantul regencies. The examination was carried out in the laboratory of Medical Faculty UGM Yogyakarta. The subjects of elephantiasis and non-elephantiasis were physically examined and blood drawn for microscopic examination, ELISA and PCR. Mosquitoes were caught at night for 12 hours inside and outside house using the human landing collection method. Mosquitoes were identified and dissected to obtain microfilariae, L1, L2 or L3 and examined PCR assay. The breeding places and cages was observed. Positive rate, vector microfilaria rate, vector infection rate and vector infective rate analyzed by calculating the proportion. The factors that influence the transmission of filariasis were analyzed univariate, bivariate and multivariate.

Results: There is a potential for filariasis in non-filariasis endemic areas. No transmission was found through *Cx. quinquefasciatus*, but transmission was found in *Ae. aegypti*. People living in the same house as elephantiasis sufferers have a 6.6 times higher risk for filariasis than those who are not at the same home.

People not actively consuming MDA drugs have a 6.3 times higher risk of filariasis than those who take them.

Keyword: *Ae. aegypti, bancroftian filariasis, Cx. quinquefasciatus, potensial vector, xenomonitoring*