J Parasit Dis (Jan-June 2011) 35(1):77–79
DOI 10.1007/s12639-011-0021-z

SHORT COMMUNICATION

JPD

Detection of filarial specific IgG4 antibodies in individuals residing in endemic areas using panLFRAPID test card

K. Athisaya Mary · S. L. Hoti · K. Krishnamoorthy · P. K. Das · N. Rahmah

Received: 13 July 2010 / Accepted: 26 January 2011 / Published online: 16 February 2011

Abstract In order to achieve the goal of global programme for elimination of lymphatic filariasis (GPELF), chemotherapy programmes are underway to interrupt transmission of the disease. At this point, detection of exposure will be more appropriate to monitor the programme and to certify areas cleared of active transmission as disease-free. A recently available cassette form of rapid test, panLFRAPID is a filarial IgG4 antibody detection test that may be useful for the programme. Therefore, we carried out a preliminary test using this cassette test on various categories of serum samples. The result showed that the test appeared to have potential in monitoring the exposure to filarial infection in GPELF.

Keywords Lymphatic filariasis · Exposure · Antibodies · IgG4 · Endemic areas

K. Athisaya Mary · S. L. Hoti (✉)
Unit of Microbiology and Immunology, Vector Control Research Centre, (Indian Council of Medical Research), Indira Nagar, Puducherry 605 006, India
e-mail: slhoti@yahoo.com

K. Krishnamoorthy
Unit of Operational Research, Vector Control Research Centre, (Indian Council of Medical Research), Indira Nagar, Puducherry 605 006, India

P. K. Das
Vector Control Research Centre, (Indian Council of Medical Research), Indira Nagar, Puducherry 605 006, India

N. Rahmah
Institute for Research in Molecular Medicine (INFORMM), Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia

Lymphatic filariasis (LF) has been identified as one of the six diseases considered eradicable or potentially eradicable (World Health Organization 1998). To achieve the goal of global elimination of LF as a public health problem by the year 2020, chemotherapy programmes (Mass Drug Administration (MDA)) are underway to interrupt the transmission of the disease. As the programme moves towards the achievement of the goal, the parasite infection in human and vector reach ultra-low levels. As a result it becomes more difficult to detect the presence of infection or even the exposure. Detection of exposure to filarial infection will be more useful and can be done by detecting filarial specific antibodies. Recently, two antibody detection kits have become commercially available, namely, WBRAPID and panLFRAPID cassette tests (Malaysian BioDiagnostics Research Sdn. Bhd). PanLFRAPID has been reported to be useful for detection of both brugian and bancroftian filariasis. A multicentric evaluation study showed that sensitivity and specificity of panLFRAPID were 96.5 and 99.6% respectively (Rahmah et al. 2007). However, there is a need to assess its usefulness in Indian endemic settings before being recommended in routine operations.

We carried out a preliminary testing of panLFRAPID test cassettes for the detection of filarial specific IgG4 antibodies as per the manufacturer's instructions and the results are presented here. We tested sera samples collected from four categories of individuals five samples in each category such as the infective (Antigen positive/microfilaria positive), the infected (Antigen positive/microfilaria negative), the endemic normals (ENs) (antigen negative/microfilaria negative) who are residing in Puducherry, India, an area endemic for bancroftian filariasis (Rajagopalan et al. 1977) and one non-EN (NEN) an European

Table 1 Detection of filarial specific IgG4 in individuals belonging to different categories residing in Puducherry using panLFRAPID test card

Sample category	Sample ID	Microfilaria count	Og4C3*antigen titer group	Antibody test
Infective (Antigen positive/ microfilaria positive)	VS 9	12	8	+
	VMP 8	19	8	+
	VMP 22	4	8	+
	S 32	4	8	+
	D 23	4	8	+
Infected (Antigen positive/ microfilaria negative)	VMP 13	0	4	+
	U 115	0	7	+
	VMP 31	0	5	−
	KD 2	0	6	+
	MP 27	0	7	+
Endemic normals (Antigen negative/ microfilaria negative)	U 66	0	0	+
	KK 9	0	0	−
	U 68	0	0	−
	KK 8	0	0	+
	PP 38	0	0	−
Non-endemic normals (Microfilaria negative/antigen negative/antibody negative)	H 1	0	0	−

* Og4c3 assay is an ELISA kit for detecting and quantifying *Wuchereria bancrofti* antigen and based on antigen units, the samples have been categorized as titer group 1–8 as per the instructions given in the user manual

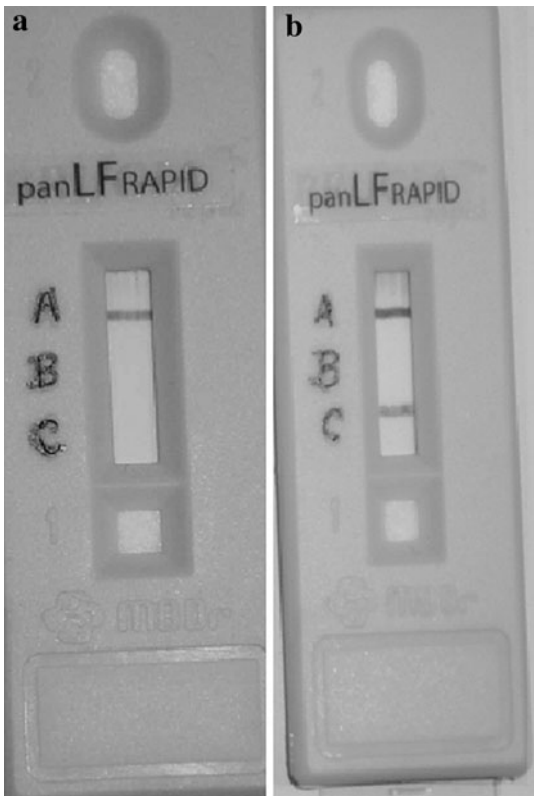

Fig. 1 panLFRAPID card test showing (**a**) negative for *Wuchereria bancrofti* specific antibodies with only the *negative control line* at *A* and (**b**) showing *positive line* at *C* for *Wuchereria bancrofti* specific antibodies along with the *negative control line* at *A*

sample found to be microfilaria negative/antigen negative/antibody negative (Table 1).

The results are shown in Table 1 and the appearance of the positive and negative cassette test results is shown in Fig. 1. The samples collected from five microfilaria positive individuals tested positive for filarial specific IgG4 antibodies. Out of five samples from microfilaria negative but antigen positive (antigen positive by Og4C3 ELISA kit being used for detecting and quantifying *Wuchereria bancrofti* antigen), four of them tested positive for antibodies; while out of five individuals who were negative for both antigen and microfilaria only two tested positive for antibodies. One sample collected from a non-EN tested negative. The results showed that the rapid test was able to detect all the microfilaria positive individuals as positives, while most of the infected (Antigen positive but microfilaria negative) individuals were also positive by the test. However, one of the antigen positive individual who tested negative for antibodies happened to have low level of antigens (titre group 5 based on Og4C3 ELISA kit). With regard to the two antibody positive individuals (Antigen negative/microfilaria negative), this result is not surprising since antibody detection test has good sensitivity (Lammie et al. 2004) than antigen detection test.

This preliminary study showed that the test under evaluation appeared to have potential application in monitoring the exposure to filarial infection in LF elimination programme. However, it needs to be tested with larger number of samples including different categories in order to validate the test kit.

Acknowledgments Authors thank Dr. M. Kalyanasundaram, Officer-In-Charge, Vector Control Research Centre for his encouragement and support. They acknowledge Prof. Dato' Dr. C.P. Ramachandran, Faculty of Medicine and Health Science, University Putra Malaysia, Malaysia, for the kind supply of the panLFRAPID cassette tests for this study.

References

Lammie PJ, Weil G, Noordin R, Kaliraj P, Steel C, Goodman D, Lakshmikanthan VB, Ottesen E (2004) Recombinant antigen-based antibody assays for the diagnosis and surveillance of lymphatic filariasis—a multicenter trial. Filaria J 3(1):9–12

Rahmah N, Itoh M, Kimura E, Rohana AR, Ravindran B, Rohela M, Supali T, Weerasooriya MV (2007) Multicentre evaluations of two new rapid IgG4 tests (WBrapid and panLFrapid) for detection of lymphatic filariasis. Filaria J 6:9 (http://www.filariajournal.com/content/6/1/9)

Rajagopalan PK, Kazmi SJ, Mani TR (1977) Some aspects of transmission of *Wuchereria bancrofti* and ecology of *Culex pipiens fatigans* in Pondicherry. Indian J Med Res 66:200–207

World Health Organization (1998) The World Health Report: life in the 21st century: a vision for all. Report of the Director General, WHO, Geneva, pp 39–60