Abstract

Results of the Rapid Diagnostic Test for Early Detection of Dengue Fever and Malaria Pilot Project Conducted at Quarantine Screening

Do Kee Hun, Song Sookjin, Yang Jinseon
Gimhae National Quarantine Station, KCDC

With the rapid increase in mosquito-borne infectious diseases worldwide, the risk of imported cases is increasing in Korea. The probability of dengue fever and malaria community outbreaks caused by overseas inflow is high. However, the current surveillance system in Korea for early detection is insufficient. In response, the Gimhae National Quarantine Station, located at the Gimhae International Airport, conducted a pilot project for early detection of imported dengue fever and malaria using a rapid diagnostic test (RDT) kit for mosquito bites or symptomatic fever. The project tested 100 participants who had traveled to Asia. One positive case of dengue fever was detected at entry screening. The survey findings indicated that 95.2% of the participants were satisfied with the RDT service and survey comments indicated that the service relieved the anxiety of contracting a mosquito-borne disease. This pilot project recommended that early detection conducted at quarantine screening plays a key role in reducing the burden of imported mosquito-borne infections.

Keyword: Rapid diagnostic test (RDT), Mosquito-borne diseases, Dengue fever, Malaria

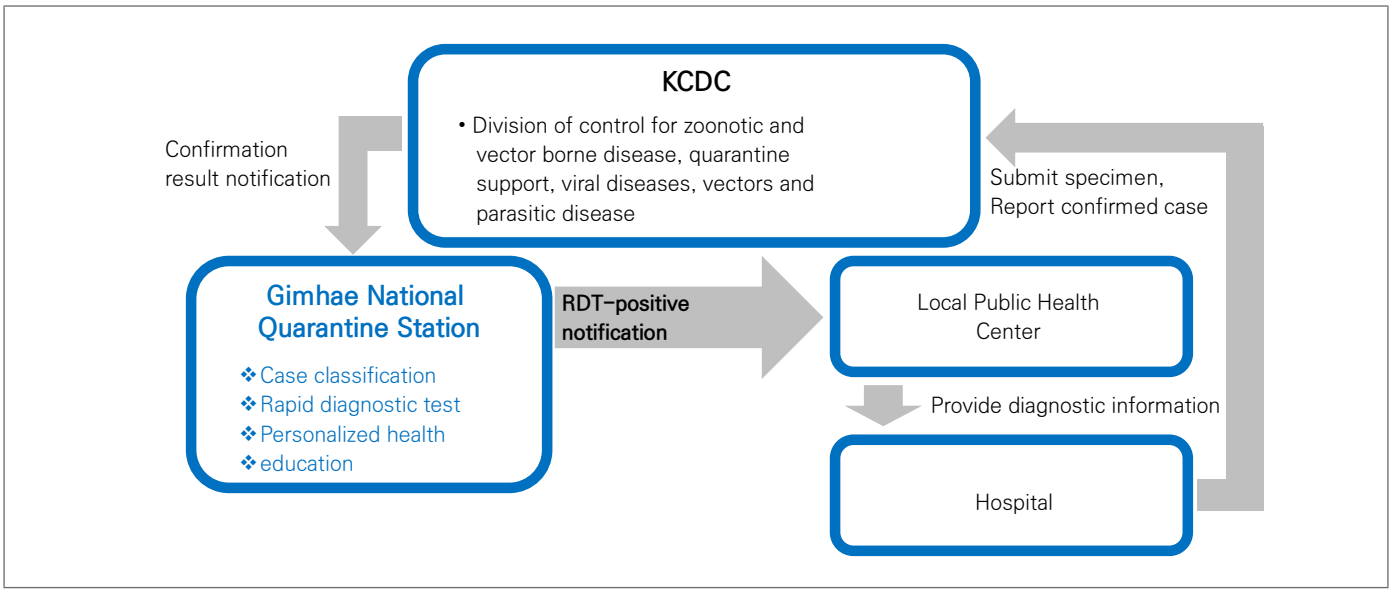

Figure 1. Strategy of the reporting process for rapid diagnostic test (RDT)–positive patients

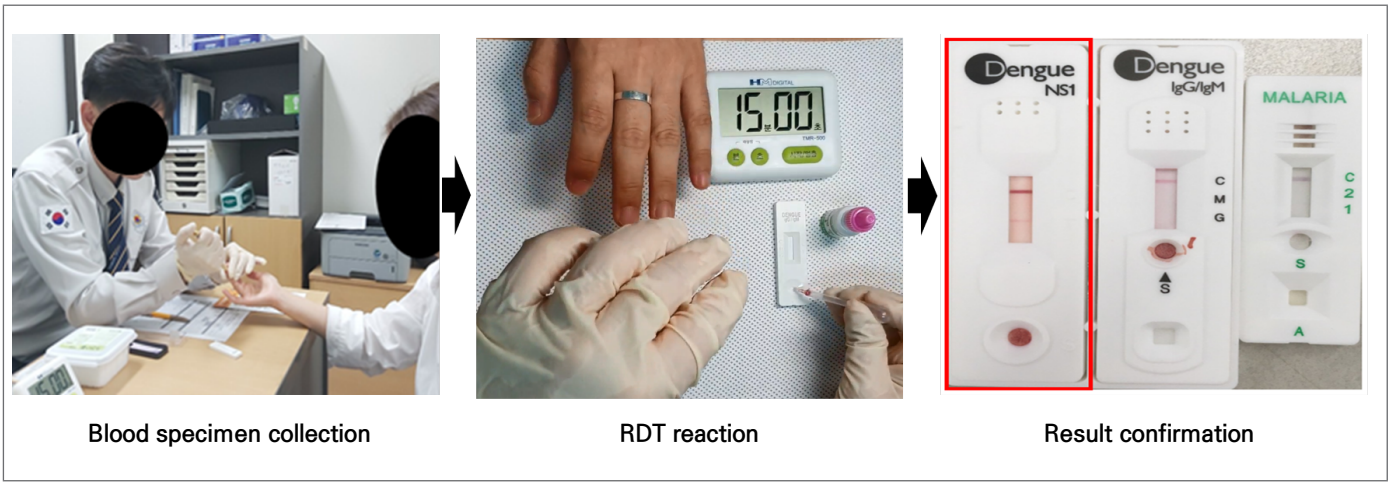

Figure 2. Rapid diagnostic test (RDT) inspection sequence

Table 1. Characteristics of rapid diagnostic test (RDT) kits

Distinction	Dengue Fever	Malaria
Type	○ Dengue Combo(NS1& IgM/IgG) – Antigen, Antibody detection	○ Malaria(Pf/PAN) COMBO – Antibody detection
Characteristics	○ (NS1) Sensitivity: 97.9%, Specificity: 99% ○ (IgM/IgG) Sensitivity: 98%, Specificity: 99%	○ Sensitivity: 99%, Specificity: 100%

Table 2. Characteristics of rapid diagnostic test (RDT) project participants (n=100)

Category		N	%
Total		100	100
Sex	Male	38	38
	Female	62	62
Age	≦9	0	0
	10–19	1	1
	20–29	33	33
	30–39	43	43
	40–49	9	9
	50–59	10	10
	≧60	4	4
Residence (City/Province)	Busan	36	36
	Gyeongnam	34	34
	Gyeongbuk	7	7
	Ulsan	7	7
	Jeonam	6	6
	Daegu	3	3
	Chungnam	3	3
	Gyeonggi	2	2
	Gwangju	1	1
	Seoul	1	1
Country Visited	Vietnam	52	52
	Philippine	19	19
	Thailand	13	13
	Taiwan	5	5
	Guam	4	4
	Maldives	2	2
	Laos	2	2
	India	2	2
	China	1	1
Symptoms*	Mosquito bites	99	99
	Chills	7	7
	Diarrhea	7	7
	Fever	6	6
	Cough	5	5
	Vomiting	2	2
	Sore throat	2	2
	Runny nose	1	1

* Multiple answers were permitted.

Table 3. Results of the dengue fever/ malaria rapid diagnostic tests (RDT) (n=100)

Category	Malaria	Dengue Fever
Total	100	100
Positive	–	1
Negative	100	96
Unknown	–	3

Table 4. Characteristics of the dengue fever positive patient

Nationality	Visited country	Period of Visit	Age	Sex	Address	Body temperature	Symptoms	Test result
Korea	India	Nov. 3, 2019 ~Nov. 13.	30s	Female	Busan	37.2℃ (had taken medication)	Vomiting, Chills, Diarrhea, Fever	Dengue-NS1 positive

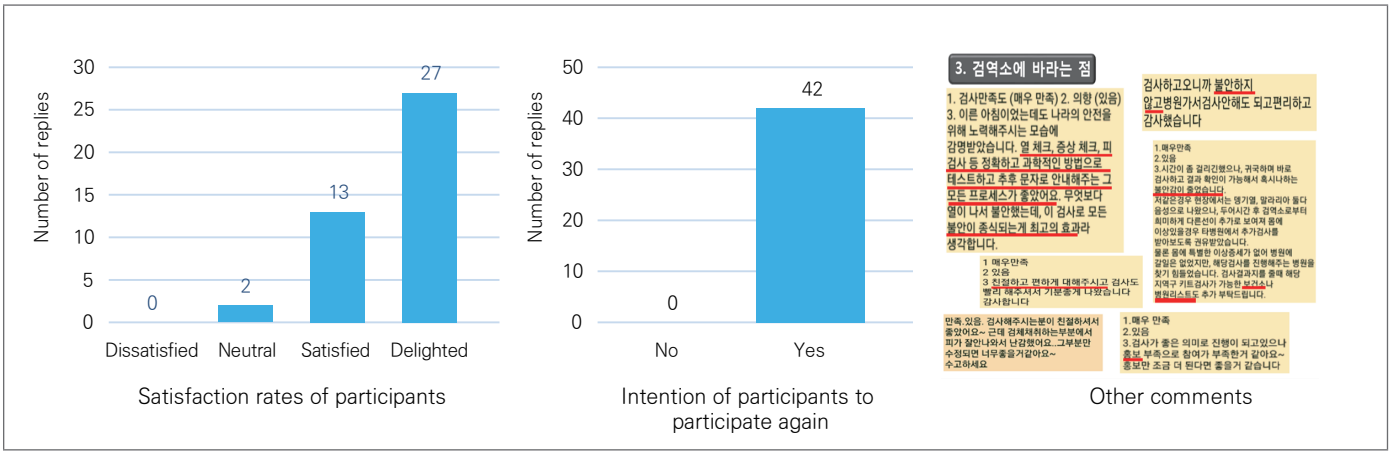

Figure 3. Results of the follow-up survey on satisfaction rates and the intention to participate again in rapid diagnostic test (RDT) participants