

Abstract

Occurrence status of imported parasitic infections, 2011-2020

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Imported parasitic infections are a class 4 legal infectious disease in the Republic of Korea. A surge in immigration and international travel has led to an increase in the number of imported parasitic infectious cases.

The aim of this study was to survey the occurrence of eleven imported parasitic infections in the Republic of Korea between 2011 and 2020: Leishmaniasis, Babesiosis, African trypanosomiasis, Schistosomiasis, Filariasis, Chagas disease, Angiostrongyliasis, Gnathostomiasis, Hydatidosis, Toxoplasmosis, and Dracunculiasis. The data came from the Korea Disease Control and Prevention Agency (KDCA), which monitored the occurrence of imported parasitic infections through sentinel surveillance and laboratory tests. The findings of this study indicated that 101 cases were reported through specimen monitoring agencies. Toxoplasmosis was the most reported infectious disease, followed by Hydatidosis, Babesiosis and schistosomiasis. A total of 186 cases were requested for laboratory tests by the KDCA, and the most requested infectious disease was Filariasis, followed by Leishmaniasis and Babesiosis. Eleven cases were confirmed as positive in laboratory tests; Leishmaniasis (4 cases), Babesiosis (2 cases), Chagas disease (1 case), and toxoplasmosis (4 cases).

Although the occurrence of imported parasitic infections was infrequent over the past 10 years, Toxoplasmosis, Hydatidosis, Babesiosis, and Leishmaniasis cases increased and were sporadically reported. This fact highlighted the necessity of managing laboratory testing methods since the characteristics of each infectious disease varies. By way of example, one of the challenges in identifying imported parasitic infections is that they are often characterized by low severity and chronic infection. In addition, this study recommended that the KDCA periodically review and prepare rapid laboratory testing methods for emerging imported parasitic disease.

Keywords: Imported parasitic infections, Sentinel surveillance, Laboratory diagnostic test












Infectious disease	Specimen	Pathogen	Vectors/Route of Transmission	Symptoms	Distribution
Leishmaniasis	Whole Blood, Serum	<i>Leishmania infantum</i> , <i>L. donovani</i> , <i>L. major</i> , <i>L. amazonensis</i> , <i>L. braziliensis</i>	Lutzomyia spp., Phlebotomus spp. 	<ul style="list-style-type: none"> Cutaneous leishmaniasis: Skin lesion (cyst or ulcer), lymphadenopathy Visceral leishmaniasis: Fever, weight loss, edema of the liver and/or spleen 	Africa, Asia, Europe, Tropics of South America, various subtropical areas
Babesiosis	Whole Blood, Serum	<i>Babesia microti</i> , <i>B. duncani</i> , <i>B. divergens</i>	Ixodes scapularis 	<ul style="list-style-type: none"> Chronic fatigue syndrome, anorexia, headache, fever, chills, muscle pain, hepatomegaly, splenomegaly, hemolytic anemia 	Worldwide, especially the tropics and subtropics
African trypanosomiasis	Whole Blood	<i>Trypanosoma brucei gambiense</i> , <i>T. b. rhodesiense</i>	Glossina spp. 	<ul style="list-style-type: none"> Skin inflammation including pain and itch, fatigue, asthenia universalis, insomnia, fever, enlarged lymph nodes 	West and Central Africa, South and East Africa
Chagas' Disease	Serum	<i>Trypanosoma cruzi</i>	Triatoma spp., Rhodnius spp., Panstrongylus spp. 	<ul style="list-style-type: none"> Fever, headache, adenitis, pale complexion, muscle pain, respiratory distress, edema, chest/abdominal pain 	Southern US extending to Central South America (e.g. Mexico, Argentina, Chile)
Schistosomiasis	Serum	<i>Schistosoma japonicum</i> , <i>S. haematobium</i> , <i>S. mansoni</i>	Exposure to contaminated waters 	<ul style="list-style-type: none"> Fever, nausea, eosinophilia, gastric distress, Hematuria, polyuria, urinary incontinence, perianal pain, etc. 	China, Japan, Philippine Islands, Southeast Asia, Middle East, Caribbean Islands, South America
Angiostrongyliasis	CSF	<i>Angiostrongylus cantonensis</i>	Consumption of raw snails, contaminated water or vegetables 	<ul style="list-style-type: none"> Eosinophilic meningitis: Headache, nuchal rigidity, photophobia, loss of visual acuity, etc. 	Southeast Asia, South Pacific Islands, Pacific Rim
Gnathostomiasis	Serum	<i>Gnathostoma spinigerum</i>	Consumption of raw fish, frogs, birds, reptiles, etc. 	<ul style="list-style-type: none"> Fever, emesis, hives, anorexia, nausea, diarrhea, epigastric pain 	Asia (India to Japan), North America
Filariasis	Whole Blood, Serum	<i>Wuchereria bancrofti</i> , <i>Brugia malayi</i>	Aedes togoi, Anopheles sinensis, etc. 	<ul style="list-style-type: none"> Fever, emesis, hives, anorexia, nausea, diarrhea, epigastric pain 	Tropics and Subtropics excluding North America and Europe
Hydatidosis	Serum	<i>Echinococcus granulosus</i> , <i>E. multilocularis</i>	Consumption of contaminated water or food 	<ul style="list-style-type: none"> Cystoma of liver, lungs, kidneys, brain, and muscles, hematuria, jaundice, abdominal pain, adynamia, coughing, chest pain, etc. 	Australia, New Zealand, Africa, South America, Europe, Middle East, Central Asia, Japan, Philippine Islands
Toxoplasmosis	Whole Blood, Serum	<i>Toxoplasma gondii</i>	Consumption of contaminated water or food, Exposure to infected cat stool 	<ul style="list-style-type: none"> Uveitis, chorioretinitis, fever, headache, myalgia, lymphadenitis 	Worldwide, especially nations with high domestic feline populations
Dracunculiasis	Tissue	<i>Dracunculus medinensis</i>	Consumption of contaminated water 	<ul style="list-style-type: none"> Blister of 2-7cm, hyperemia, pink eye, pain, itchiness, allergic reaction (anaphylaxis or localized) 	Africa (between the Equator and Sahara Desert), Pakistan, India

Figure 1. Pathogen, infection route and clinical symptoms of imported parasitic infections

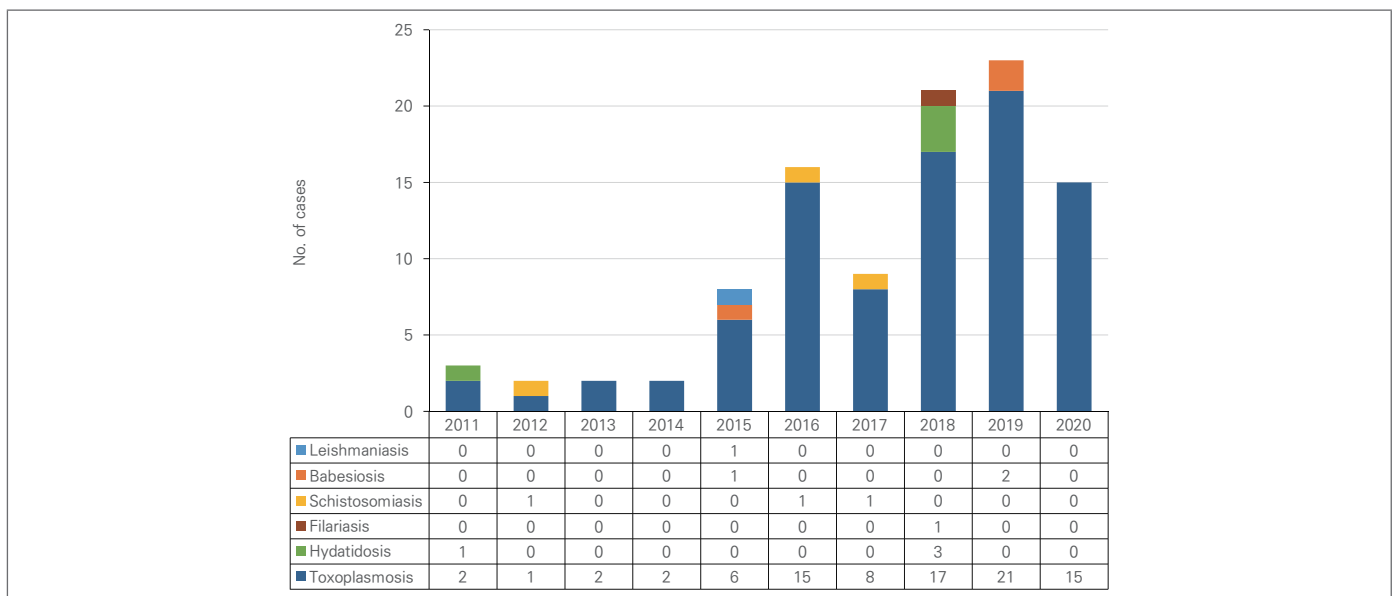


Figure 2. Occurrence report of imported parasitic infections by year (2011–2020) in the Republic of Korea

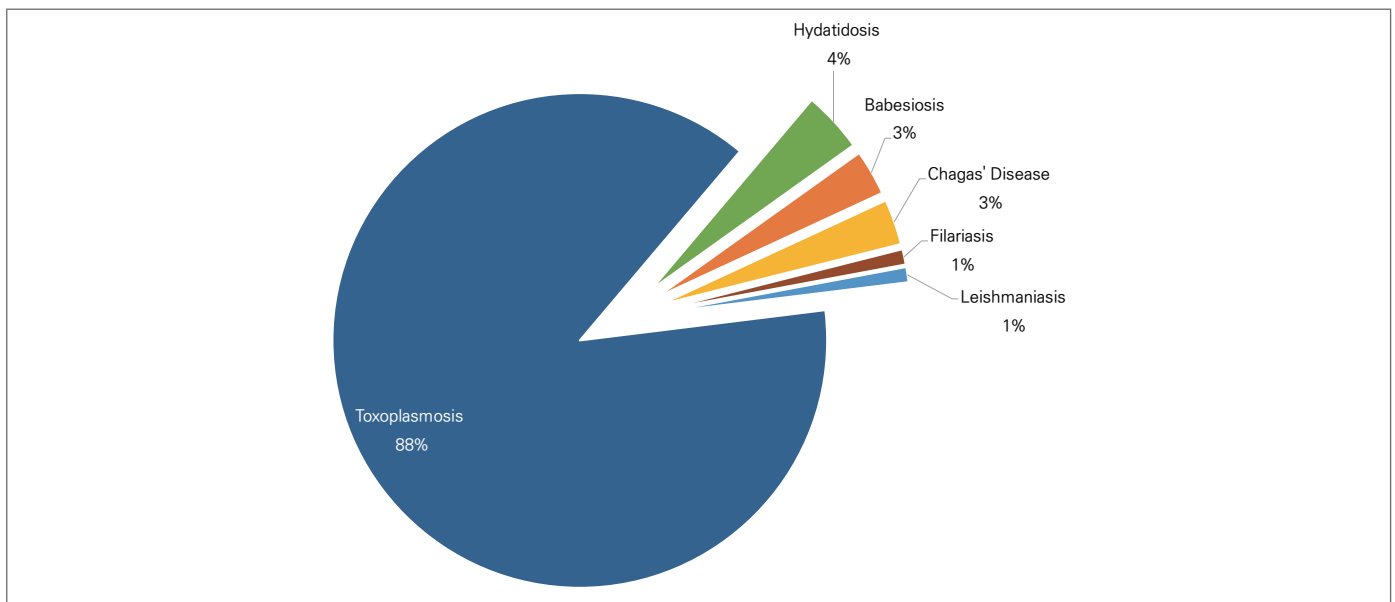


Figure 3. Occurrence ratio of imported parasitic infection type in the Republic of Korea

Table 1. Laboratory diagnostic test list of imported parasitic infections by the KDCA

	Specimen Type	Microscopic test	Molecular test	Antibody detection test
Leishmaniasis	Whole blood, Tissue	○	○	—
Babesiosis	Whole blood	○	○	—
African trypanosomiasis	Whole blood, CSF	○	○	—
Schistosomiasis	Stool, Urine, Serum	○	—	○
Chagas' Disease	Whole blood, Serum	○	—	○
Angiostrongyliasis	Whole blood, Tissue	—	○	—
Gnathostomiasis	Tissue	○	—	—
Filariasis	Whole blood, Serum	○	○	○
Hydatidosis	Serum	—	—	○
Toxoplasmosis	Whole blood, Serum	—	○	○
Dracunculiasis	Laboratory test not needed			

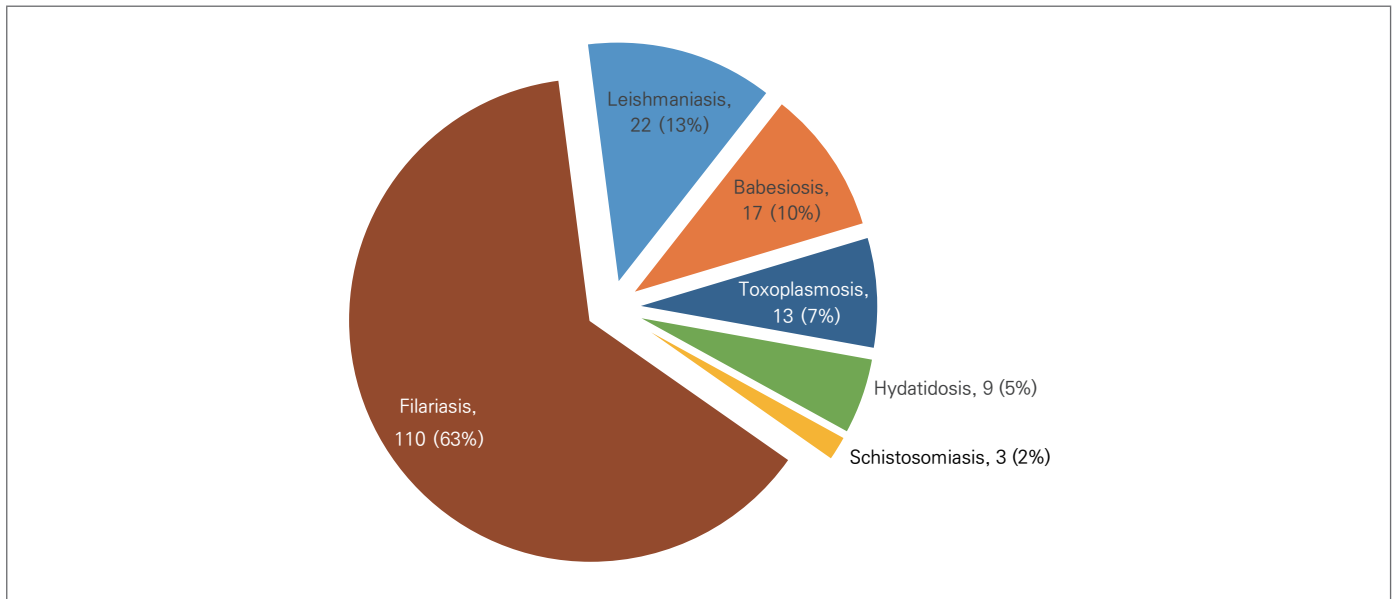


Figure 4. Ratio of laboratory diagnostic test request by imported parasitic infection type in the Republic of Korea