Abstract

Severe Fever with Thrombocytopenia Syndrome close contacts testing between humans and companion animals: pilot project results

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Severe Fever with Thrombocytopenia Syndrome (SFTS) is a zoonotic infectious disease that occurs, not only in humans, but in animals. Recently, transmission of SFTS from companion animals to humans was reported in Japan, that is growing concern among health officials in Korea. The Korea Disease Control and the Prevention Agency (KDCA) and the Animal and Plant Quarantine Agency (APQA) launched a joint pilot project aiming at monitoring and diagnosis to early detection SFTS cases for SFTS humans and companion animals case's close contacts. Among the companion animals who visited veterinary hospitals from July to December 31, 2020, 107 points of serum or tick samples were collected from animals that have been bitten by ticks or have symptoms of SFTS. SFTS was confirmed in two of them, but none of the guardians and veterinary hospital workers in close contacts had symptoms. 11 samples were collected from five companion animals of SFTS patients, of which two were confirmed positive.

In addition, one strain of animal-derived Severe Fever with Thrombocytopenia Syndrome Virus (SFTSV) was isolated from the serum of one SFTS-positive companion animal. As a result of sequencing analysis of the virus, it showed high homology with human-derived viruses (more than 99.7%). So it could be estimated that companion animals and humans share a common infectious agent.

This project could not identified a link between companion animal and human infections due to restrictions on the region and project scale. However, it was significant in establishing a joint response system with relevant organizations and in confirming the need for preventive management for veterinary hospital workers.

Keywords: Severe Fever with Thrombocytopenia Syndrome (SFTS), Ticks, Companion animals, Veterinary hospital workers

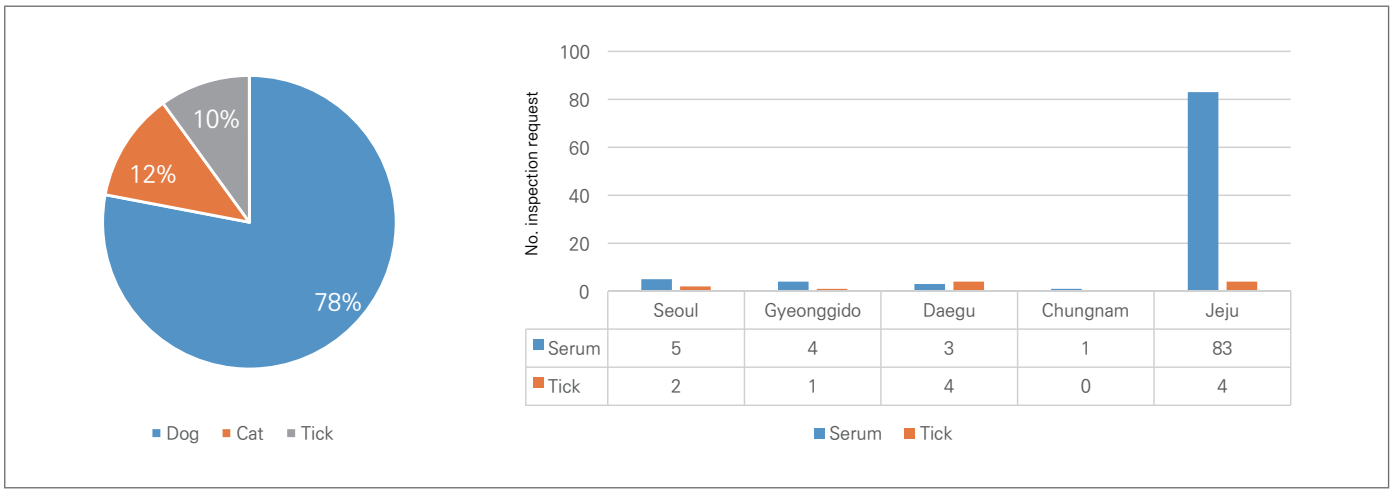

Figure 1. Status of request for Severe Fever with Thrombocytopenia Syndrome (SFTS) inspection for companion animals and ticks by region

Table 1. Status of Severe Fever with Thrombocytopenia Syndrome (SFTS) positive companion animals and monitoring results of contacts

Companion animals Type (Gender/ age)	Region	Date	Symptom	Remarks	Monitoring results of contacts
Dog (M/5)	Jeju city	8.14	Fever (39.5℃), diarrhea, vomiting, bloody in stool, general weakness, low white blood cells and platelets count	Babesiosis positive	Total 12 persons (guardians 2, veterinary hospital workers 10), no symptoms
Dog (F/9)	Jeju city	8.29	Check for ticks on the body, fever (38.9℃), low white blood cells count, general weakness, anorexia	Death after uterine sinus surgery, SFTS virus isolation, Negative tests for other tick-borne diseases	Total 13 persons(guardians 1, veterinary hospital workers 12), no symptoms

Table 2. The test results for companion animals of Severe Fever with Thrombocytopenia Syndrome (SFTS) patients

No.	Region	Companion animals Type (age)	Sample collection date	Sample Type	Results of SFTS test	
					Antigen	Antibody
1	Jeonbuk Jangsu-gun	Dog (15)	8.19	Serum 1	Negative	Negative
		Dog (7)		Serum 1		1:40
		Dog (4)		Serum 1		1:160
2	Jeonnam Haenam-gun	Dog (unknown)	9.10	Serum1, eyelid1, nasal cavity1, anus1	Negative	Negative
		Dog (unknown)		Serum1, eyelid1, nasal cavity1, anus1		Negative

Table 3. BLAST analysis results for Severe Fever with Thrombocytopenia Syndrome (SFTS) virus isolate genome segments

Genome segment	Strains showing highest similarity	Similarity (%)	Accession No.
L	Human/Korea/KS13/2015	99.76	MF094805
	Human/Korea/16KS20/2016	99.73	MF094736
M	Human/Korea/KS13/2015	99.88	MF094811
	Human/Korea/KS17/2015	99.85	MF094814
S	Human/Korea/JJ01/2015	99.77	MN329148
	Human/Korea/16KS20/2016	99.77	MF194786

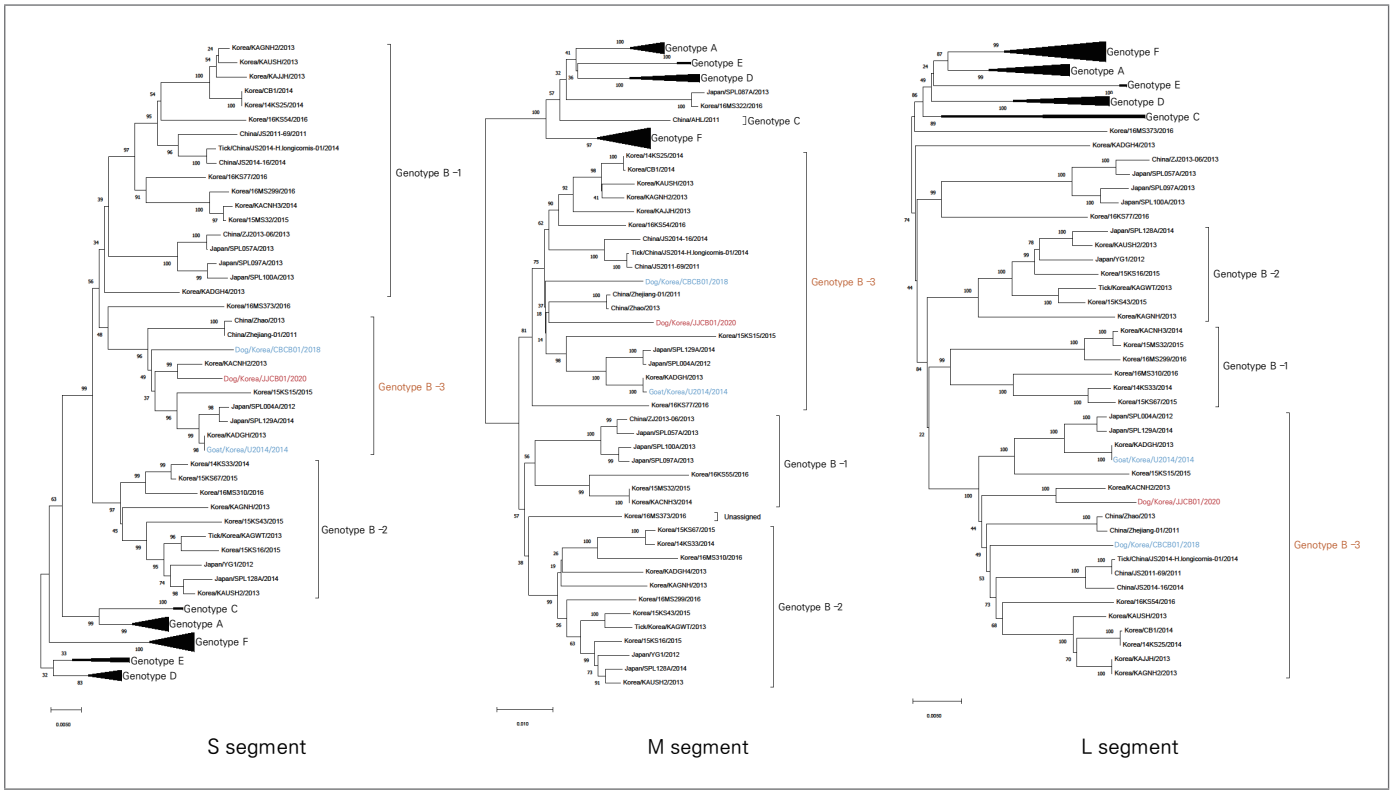

Figure 2. Phylogenetic analysis based on the complete coding sequences of S, M and L segments of Severe Fever with Thrombocytopenia Syndrome Virus (SFTSV) isolate