Psychosocial factors influencing the behavior of swine veterinarians during the foot and mouth disease outbreak in Korea

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Abstract: After the Foot and mouth disease outbreak during 2010~2011 in Korea, failure to communicate and collaborate with those involved in the outbreak was criticized by many. The animal disease control process is not limited to the technical field of veterinary medicine but rather is interrelated to the psychosocial factors in the whole community where an epizootic occurs. Getting a holistic view of local problems caused by a disease is the core element of the One Health approach, which considers human, animal and environmental health within one frame and focuses on communication and collaboration among all key players in disease control. From this perspective, veterinarians who routinely assess animal health problems that include human and environmental factors should have a role as health facilitators for the whole process. This survey of seventy one swine veterinarians shows that psychosocial factors such as the One Health awareness, social capital, accessibility to resources, and support from society can influence the behavior of local swine veterinarians. The results suggest that local veterinarians should be actively involved in the decision-making process during an FMD outbreak to overcome the deep-rooted distrust among key players. Therefore, continuing education programs teaching about the One Health principle to livestock veterinarians are strongly needed to reorient their view and their role in epizootic control, which could contribute to more practical and flexible responses during a livestock disease outbreak and to a rapid recovery after the disease.

Key words: Psychosocial factors, one health, foot and mouth disease, swine veterinarian

INTRODUCTION

The recent Foot and Mouth Disease (FMD) outbreak (2010~2011) in Korea caused disastrous damage in rural communities and in the livestock industry nationwide. About 3 million pigs and 1.5 million cattle were culled in 11 provinces during the winter. Poor scientific decision-making such as the timing of vaccination, effectiveness of disinfectant, and establishing a standard operating procedure (SOP) for the disease as well as failure to collaborate and communicate with key players involved in the outbreak all contributed to the disaster [6]. Civil organizations criticized that governmental policies had failed and federal authorities and governmental agencies were not prepared to deal with the FMD outbreak [7]. As seen from past outbreaks, FMD, as an epizootic, has complicated social, cultural, political and economic aspects [13]. To eradicate a livestock disease, understanding the interactions among the key players in a local community is necessary [9]. Getting a holistic view of local problems caused by a disease is necessary in the One Health approach, which considers the health of humans, animals and the environment in one frame [14]. Veterinarians take important roles in this frame because they are the first ones who detect suspicious cases from farms and help farmers to report the cases to the local authorities. Therefore, what they actually perceive and do are of great importance to controlling FMD. The aim of this study was to identify what individual factors and environmental factors influenced the behavior of local swine veterinarians during the FMD outbreak in Korea (2010~2011).

MATERIALS AND METHODS

Study model and design

Despite their importance, predicting and analyzing socio-cultural factors related to the behaviors of key players involved in epizootic control and prevention are challenging tasks. The theory of planned behavior (TPB) [1] has usually been used to analyze the health behaviors of key players involved in an epizootic outbreak. Based on the TPB model, the intention of livestock farmers to ask veterinarians to examine cattle with clinical signs of FMD was investigated [2]. Besides behavioral beliefs, control beliefs and normative beliefs, risk perception, moral norms and trust were included in the model.

The social ecology model [11] focuses more on cultural factors which can influence behavioral changes in health interventions. A theoretical framework based on behavioral science and
epidemiology was established for a zoonotic control program on cattle farms [3]. It conceptualized intrinsic and extrinsic circumstances to explain the three different steps of behavioral changes in farmers: intention to control, implemented control program and sustained control. Although the influence mechanism of social structure and relationships in health behavior has not been completely revealed, its positive influence could not be ignored [8]. Behavior related to animal disease control may be different from human health behavior because it works more on an economic background. However, in the One Health perspective, psychosocial factors should be taken into account for communication and collaboration through the whole process of epizootic control.

In this study, a model by Delgado et al. [2] and Ellis-Iversen et al. [3] was built using the additional factors of one health awareness and social support. After group interviews with five local swine veterinarians (four from Hongcheon and one from Dongducheon) and three livestock farmers (one from Paju and two from Dongducheon) that experienced the 2010–2011 FMD outbreak in their local areas, a network for livestock farming and the 1st alarm for livestock disease were described as a result of the interviews (Fig. 1). Besides locals wine practitioners, veterinarians working in animal feed companies and veterinary pharmaceutical companies also took part in the network closely related to the farms. What the veterinarians mainly did from a technical and communication perspective during the FMD outbreak was listed to establish the dependent variables of their behaviors for the study. Individual influential factors consisted of three components: personal attributes, the One Health perspective and the intrinsic values of TPB. Personal attributes included working region, career years and specialty and FMD experiences. Environmental factors were categorized as interpersonal, community (social capital), resources and trust and support (Fig. 2).

**Questionnaire**

About 80 participants of the Korean Forum for Swine Veterinarians held by Korea Association of Swine Veterinarians on March 15, 2012 received the questionnaire and 71 participants responded (24% of the total number of the association).

**Analysis**

The collected data was summarized as means and percentiles. Questions with a factor loading value under 0.5 (Cronbach alpha <0.5) were omitted from the hierarchical regression analysis (p<0.05). Because of the limited sample size, the statistical power of the analysis was checked using G* Power 3.1 [4]. The effect size of the analysis was 2.08 and the sample size for a power of 0.8 was 70. IBM SPSS Statistics 19.0 was used and missing values were not replaced with normal or mean values.

**RESULTS**

**Descriptive statistics**

Thirty-nine point four percent of the respondents were practicing swine veterinarians and 47.9% belonged to animal feed companies or veterinary pharmaceutical companies. Both types of veterinarians provide consultation for livestock breeding and disease control. Forty-four point three percent of the respondents have been working for over 10 years and 64.2% of the respondents have been working in the Kyungki and Chungcheong provinces. Sixty-nine point two percent of the total respondents experienced the FMD outbreak during 2010–