Subclinical Mastitis in Dairy Cows in High Milk Producing Areas of Sri Lanka: Prevalence, Associated Risk Factors and Effects on Reproduction

Ranasinghe R.M.S.B.K.[a*], Deshapriya R.M.C.[b], Abegunawardana D.I.[a], Kumara U.M.A.P.[a], Samarakoon S.M.C.L.[a], Rahularaj R.[b] and Umayanga H.A.D.I.[a]

[a] Department of Livestock and Avian Sciences, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura, Gonawila (NWP), Sri Lanka;
[b] Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka.
*Corresponding author (email: bimalka58@yahoo.com, bimalkar@wyb.ac.lk)

Abstract

Subclinical mastitis (SCM) causes huge economic losses to the dairy industry since it is difficult to detect due to absence of any visible clinical indications or changes in milk. The information on prevalence, associated risk factors of SCM is scarce in Sri Lanka. Further, it has been suggested that mastitis affects reproductive performance of dairy cows but it has not been studied in Sri Lankan cattle population. Therefore, this study was conducted to determine the prevalence, risk factors associated with SCM and the effects of SCM on reproductive performance of dairy cows in Kurunegala (region A), Ampara (region B), and Kandy and Nuwaraeliya (region C). A total of 1357 lactating cows in selected large and small scale farms in the above mentioned areas were examined and included in the study during the period from April 2014 to July 2015. Farms were visited during morning milking and California Mastitis Test (CMT) was conducted for each cow. Cows which gave a score of 2 or 3 for any of the quarter and without any clinical symptoms and abnormalities in milk were considered as positive for SCM. Samples from infected animals were transported in ice to the relevant laboratories for bacteriological analysis. Data on individual cows and herds were collected using a pre-tested questionnaire. Associated risk factors for SCM were analyzed using logistic regression. The effect of SCM on reproductive parameters were analyzed by survival analysis using Cox's proportional hazards regression. Kaplan-Meier survival function estimates were used to calculate crude associations of normal and SCM positive cows with median time from calving to Artificial Insemination (AI).

The prevalence of SCM were 57.5% , 45.1% and 11.4% in the regions A, B and C, respectively. The most common pathogen was coagulase-negative *staphylococcus aureus,* 87.1%, 92.3% and 56.5% in the regions A, B and C, respectively followed by *E. coli* in the region A and B, 12.9% and 6.3%, respectively and *Streptococcus spp.*(10.8%) in region C. Logistic regression analysis for the risk factors for SCM indicated that breed, parity, farming system, milking area, milking method and

region significantly affect the prevalence of SCM ($P < 0.05$). Survival analysis showed that SCM was not associated with days from calving to conception ($P > 0.05$). Adjusted for covariates, SCM was associated with an 18% [hazard ratio (HR) = 0.82] increase of the chance of having a higher number of AI per conception ($P < 0.05$). Likewise, median days from calving to AI were longer in cows with SCM compared with normal cows, 79 and 64 days, respectively. ($P = 0.02$). The results revealed that the cow factors and hygienic measures during milking play a significant role in the prevalence of SCM. The SCM also affects the total number of AI and the inseminated proportion of lactating cows in the studied areas.

Keywords: Dairy cows; Reproductive parameters; Risk factors; Subclinical mastitis