

ABSTRACT

Introduction: Leptospirosis is a zoonotic infection with significant morbidity and mortality. As an occupational disease, it has become a global concern due to its disease burden and economic burden in endemic countries and rural areas like Monaragala.

Objectives: The aim of this study was, 1) to assess disease burden in terms of DALYs, 2) to analyze factors associated with delays in seeking treatment of patients, 3) to assess the effectiveness of an educational intervention for knowledge among farmers in Monaragala District and 4) to estimate provider cost of leptospirosis at District General Hospital Monaragala.

Methods: A hospital-based descriptive cross-sectional study was conducted to assess the disease burden in terms of DALYs of leptospirosis and to describe socio-demographic factors associated with delays in seeking treatment by patients with leptospirosis using 450 clinically diagnosed leptospirosis patients admitted to base and above hospitals using a pretested interviewer administered questionnaire among laboratory confirmed leptospirosis.

A hospital-based cost estimation study was conducted in DGH Monaragala using the scenario building technique, to assess the provider cost of laboratory confirmed leptospirosis patients using three standard management profiles as uncomplicated ward treated, complicated ward treated and ICU treated. Provider cost for ICU was further estimated according to different sequelae of ICU treated patients.

An interventional package was developed and delivered using SMS, post cards, announcements and education through GPs, aiming to minimize delays related to the awareness in seeking treatment for leptospirosis. The effectiveness of the intervention was measured using an interviewer administered questionnaire among 158 farmers.

Results: Leptospirosis disease burden in Monaragala district was 44.9 DALYs per 100,000 population which includes 33.18 YLLs and 10.9 YLDs. The incidence of leptospirosis in Monaragala district during the study period from the present study was 59.8 per 100,000 population and the case fatality rate (CFR) was 1.5% due to delay in health seeking behaviour; 75% of deaths were among males due to multi organ failure.

The provider cost per **uncomplicated leptospirosis patient** (N=131) treated at ward per day was Rs. 5449.39 and the total provider cost of uncomplicated leptospirosis patient treated at ward for the entire stay of 4 days was Rs. 21,797.54. The provider cost per **complicated leptospirosis patient** (N=58) treated at ward per day was Rs. 5695.35 and the total provider cost per complicated leptospirosis for the entire stay of 7 days was Rs. 39,867.43. Provider cost of **ICU managed** cases were calculated according to the disease sequelae. Per day cost per ICU treated patient with complications of renal, cardiac, pulmonary, neurological and multi-organ failure was Rs. 26,538.79, Rs. 28,212.39, Rs. 29,657.10, Rs. 26,444.85 and Rs. 28,363.17 respectively. The total provider cost of laboratory confirmed leptospirosis patients treated at DGH Monaragala during the study period was Rs. 7,916,564.52 and 34.7% of the total provider cost of leptospirosis in DGH Monaragala was spent for the management of eleven complicated patients treated at ICU.

Significant socio-demographic factors associate with delays in seeking treatment by laboratory confirmed patients in bi variable analysis was marital status (OR=1.85; CI=1.02-3.33), monthly income (OR=2.63; CI=1.02-7.14), time taken to reach a health care facility (OR=4.95; CI=1.48-16.62) and cost of travel (OR=2.73; CI=1.10-6.75), while age (OR=1.25; CI=0.68-2.28), sex (OR=1.44; CI=0.69-2.98), education (OR=1.5; CI=0.88-2.77), nationality (OR=1.64; CI=0.39-6.66), occupation (OR=1.01; CI=0.56-1.81), distance from home to a health care facility (OR=1.44; CI=0.79-2.59) and mode of travel (OR=1.78; CI=0.92-3.57) was not significant. After adjusting for the effect of confounders, only the source of infection of leptospirosis showed a significant association (AOR=3.65; 95% CI=1.48-8.98) with delay in seeking treatment.

The pre- and post-intervention assessment revealed that awareness in seeking treatment of leptospirosis had significantly improved two months after intervention (OR=4.59; CI=3.9-5.2).

Conclusions and Recommendations: The disease burden of leptospirosis in Monaragala district and the provider cost of leptospirosis in DGH Monaragala was significantly high and urgent efforts to prevent and control leptospirosis should be a priority. Awareness programmes through SMS, post cards, announcements and via GPs to reduce delayed health seeking are recommended.

Key words: Disease burden of leptospirosis, Disability Adjusted Life Years, Provider cost, Delays, Awareness in seeking treatment of leptospirosis