WG 2 (Preventive Medicine and Healthcare Policies)

Leishmaniasis in 2 Military Bases, a "One Healt" Approach

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Background:
Leishmania major and Leishmania infantum infections were evaluated in rodents and sand flies during a 2022–2023 cutaneous leishmaniasis (CL) outbreak in two military camps in southern Israel. The efficacy of novel rodent control intervention was also assessed.
Methods:
Sand flies and rodents were tested for Leishmania by PCR targeting the ITS1 locus. Precision spreading of pesticides using drones was performed in April 2023 in Camp 2, while Camp 1 served as a control. Infection rates in the vector sand fly and reservoir hosts and CL incidence in soldiers were compared to pre- and post-intervention.
Results:
Of 9,696 Phlebotomus papatasi females collected, 7,204 were analyzed for Leishmania DNA. L. major infection rates in sand flies from Camp 2 significantly decreased from 1.23% (2022) to 0.03% (2023) (p=0.034). No significant change occurred in Camp 1 (0.5% vs. 0.22%, p=0.622). Among 63 rodents tested, 8 were infected: L. infantum was found in 2/11 (18.2%) Mus musculus and 3/52 (6%) Meriones tristrami, while L. major was detected in 3/52 (6%) M. tristrami. Leishmania infection in rodents significantly declined in both camps combined, particularly in Camp 2 (33.6% in 2022 vs. 3.3% in 2023, p=0.032, p=0.02). CL incidence in soldiers also dropped significantly from 17.1 to 2.6/1000 in Camp 1 and 33.3 to 4.9/1000 in Camp 2 (p<0.001).
Conclusions:
Significant reductions in Leishmania infection in vectors and reservoir hosts followed the intervention. However, as leishmaniasis is multifactorial, attributing this decline to a single factor is challenging. Further studies are needed to evaluate the efficacy of new technologies in vector-borne disease control.

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Tick Borne Relapsing Fever in Training Sites

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Background:
Tick-borne relapsing fever (TBRF), caused by Borrelia persica, is endemic to Israel and highly prevalent among military personnel. Prevention in the Israel Defense Force (IDF) relies on awareness campaigns in hyperendemic areas and selective post-exposure prophylaxis (PEP) with doxycycline. This study aims to reduce TBRF exposure by (1) collecting soft ticks and environmental data from training locations with and without reported cases, (2) conducting molecular identification of B. persica, (3) developing a TBRF infection map and (4) refinement of disease prevention guidelines and environmental treatment in affected sites.
Methods:
TBRF case data was obtained from public health officers. Ticks were collected using carbon dioxide traps from caves and bunkers, morphologically identified, and molecularly analyzed for B. persica via PCR, targeting the Borrelia flaB gene at the Hebrew University's Veterinary School. Environmental treatment with lambda-cyhalothrin (9.7%) was applied in seven bunkers.
Results:
Mapping vector dispersion
Surveillance covered 23 locations (5 caves, 14 bunkers, 4 burrows), yielding 5,507 Ornithodoros Tholozani ticks. A total of 530 were analyzed, 9 (1.7%) from 4 sites tested positive for B. persica (range: 0–4.9%). A TBRF infection map was created using GOVMAP, covering 23 training sites and 24 civilian locations.
Case study – bunker related outbreak
A suspected outbreak in four soldiers who spent 30 hours in an abandoned bunker led to the collection of 255 O. Tholozani ticks, with 1% testing positive. Additional surveys in 13 bunkers found ticks in two, though all tested negative. The presence of earth or sand inside caves or bunkers was significantly associated with tick infestations (p=0.03, OR=26.4). Pest control was 100% effective, with no ticks recovered after 117 days.
Conclusions:
Military bunkers may harbor B. persica-infected soft ticks, posing a risk similar to caves and archaeological sites. The TBRF infection map will help prevent training in high-risk locations and reduce exposure.