THE CHALLENGE OF VALIDATION OF ELIMINATION

Piero Olliaro

Consortium: Setting the Post Elimination Agenda for Kala-Azar in India (SPEAK India)

New Delhi, India, 3rd - 5th November 2016
Preconditions:
1. National strategic guideline for KEP
2. Adequate health services for early detection, treatment & follow-up
3. Adequate epidemiological surveillance system
4. Integrated vector control management
Challenges

Issues with elimination target:
• 1/10,000 = still high numbers in densely-populated areas
• Unaccounted cases in non-programme areas
• \( R_0 \) ?

Issues with tools/approaches:
• No PoC antigen detection test – but antibody detection OK for elimination
• No vaccine for eradication
• Sustainable case-detection and vector-control systems; vertical vs. integrated programmes
• New priorities, diverted resources
• Cases missed by index-case & camps; delays – community health workers; EWARS

Open questions: role of subclinical and PKDL cases in transmission
→ Elimination of transmission (zero-transmission)
Non-intervention area

20 cases / 10,000

1 case / 10,000

individual VL case

Discrete transmission range

\( \text{Non} - \text{intervention area} \)

\( \lim_{x \to \infty} (x \cdot 0.9)^{\frac{x}{0}} = 0 \)

\(< R_0 \)
RESEARCH ARTICLE

Transmission Dynamics of Visceral Leishmaniasis in the Indian Subcontinent – A Systematic Literature Review

Siddhivinayak Hirve¹, Marleen Boelaert², Greg Matlashewski³, Dinesh Mondal⁴, Byron Arana⁵, Axel Kroeger⁶, Piero Olliaro⁷

1 Global Influenza Programme, World Health Organization, Geneva, Switzerland, 2 Epidemiology and Control of Tropical Diseases, Institute of Tropical Medicine, Antwerp, Belgium, 3 Department of Microbiology and Immunology, McGill University, Montreal, Canada, 4 Nutrition and Clinical Services Division, International Center for Diarrheal Disease Research, Dhaka, Bangladesh, 5 Drugs for Neglected Diseases Initiative, Geneva, Switzerland, 6 Special Programme on Research and Training in Tropical Diseases, World Health Organization, Geneva, Switzerland

ARTICLE OPEN

Health-seeking behaviour, diagnostics and transmission dynamics in the control of visceral leishmaniasis in the Indian subcontinent

Graham F. Medley¹, T. Déirdre Hollingsworth²,³, Piero L. Olliaro⁴,⁵ & Emily R. Adams²,⁶
Transmission dynamics: conceptual framework

- **Susceptible human host**
- **Asymptomatic infected**
- **Recovery Relapse**
- **Active KA**
- **PKDL**

**Markers**
- Burden
- Natural history
- Risk factors
- Infectiveness

**Markers**
- Burden
- Risk factors
- HIV co-infection

**Markers**
- Natural history
- Infectiveness

**Markers**
- Burden
- Natural history
- Risk factors
- Infectiveness

**Infectiveness**

**Burden**

**Natural history**

**Risk factors**

**Infectiveness**

**Susceptible Sandfly**

**Infected sandfly**

**Susceptible human host**

**Asymptomatic infected**

**Active KA**

**PKDL**

**?Animal host?**

**SF infection markers**
- SF infectiveness

**SF infection markers**
- SF infectiveness

**SF abundance**
- SF survival

**SF abundance**
- SF survival
Risk factors: HIV, Malnutrition, Young age

Leishmania INFECTED

DISEASED Kala-azar

TREATED

Relapse

Heal

PKDL

Ratio I:D = \{4:1 – 10:1\}

Ratio T:D \propto \text{programme effectiveness}

Ratio H:R \propto \text{treatment effectiveness}

Asymptomatic

33-87% w/in 1 y

2-25% w/in 1 y (18-69% if contact)

Symptomatic
delay = 2-3 m

Resolution

Dx, Rx

Rx

\frac{<5\% (25\% \text{ if HIV+})}{\text{Heal}}

\frac{<1-15\% \text{ w/in 2 y}}{\text{Relapse}}

\frac{PKDL}{PKDL}

\frac{\text{infectivity}}{\text{infectivity}}
TDR involvement in research to inform KEP strategy

Reach out for cases
Reduce morbidity
Prevent infection

Country Researchers + Control Programmes
Generate research questions
Develop Interventions
Test Interventions

Adoption by National Control Programme
Optimize implementation; Adapt to change
THANK YOU