Kala Azar in South Asia

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Editors

Kala Azar in South Asia

Current Status and Sustainable Challenges

Second Edition

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Preface

There are no whole truths; all truths are half-truths. It is trying to treat them as whole truths that plays the devil.

Alfred North Whitehead

Neglected tropical diseases (NTDs) are a group of diseases with a devastating impact on people in their prime or younger in endemic areas. Some illnesses are abrupt in onset and cured relatively easily. Others occur in chronic or subacute fashion and prove rather difficult to remedy. The impacts are partly linked to socioeconomic factors; risks of losing a daily job due to treatments, insufficient drug efficacy further increasing hospitalization necessity or stay duration, medical expenses, prevalence of fake drugs, folk remedies, and so on. Because these patients often belong to the lowest economic class, they do not have a stable place to live and move frequently, and may not retain the same cell phone number, prognostic surveillance in endemic areas is extremely difficult to conduct.

If a disease has strong infectivity and is life threatening, policy makers must cope with it immediately and completely. NTDs are not at that threat level and have been neglected historically. However, the social burden is high because the victims, often children and the prime generation in each country, become encumbrances. Visceral leishmaniasis (VL), also known as kala-azar, is a part of the spectrum of NTDs and combines all the earlier mentioned traits. Many stakeholders have contributed from the beginning of the twenty-first century in the Indian subcontinent to reducing the incidence of VL; this goal formed the basis of a memorandum of understanding shared through WHO with ministers in the countries concerned. SATREPS, funded by JICA and JST, is one of the first projects stating the necessity of simple and reliable diagnostic procedures in endemic areas. Ours has been the only project targeting NTDs from Japan until 2015.

This scope was introduced in the first edition. The present edition further explores the practical applicability of methods of disease control that have been lacking in the NTD field, and data collection is still ongoing. All of the contributing authors are experts and have devoted part of their careers, in cooperation with other

stakeholders, to VL disease control for people living in endemic areas. I hope this volume will tack the sail for disease eradication and allow it to catch the wind and make way to a speedy conclusion.

Tokyo, Japan
March 2016

Eisei Noiri

Contents

Part I Introduction Into Kala-Azar

- 1 Pathology and Mechanism of Disease in Kala-Azar** 3
Shyamal Paul and Monira Pervin
- 2 Containing Post Kala-Azar Dermal Leishmaniasis (PKDL):
Pre-requisite for Sustainable Elimination of Visceral
Leishmaniasis (VL) from South Asia** 7
Poonam Salotra, Himanshu Kaushal and V. Ramesh
- 3 Characteristics of Patients Visiting Suruya Kanta
Kala-Azar Research Center in Mymensingh, Bangladesh;
Data from a Patient Registry System** 23
Masao Iwagami, Bumpei Tojo and Eisei Noiri

Part II Therapeutic Strategy to Deal with Emergence of Drug Resistance

- 4 Epidemiology of Drug-Resistant Kala-Azar in India
and Neighboring Countries** 33
T.K. Jha
- 5 A Therapeutic Strategy for Treating Visceral Leishmaniasis
in Regions with Drug Resistance** 53
Shyam Sundar and Dipti Agarwal
- 6 Treatment of Post-kala-azar Dermal Leishmaniasis** 67
V. Ramesh and Prashant Verma
- 7 Combination Therapy for Leishmaniases** 79
Farrokh Modabber
- 8 Vaccine Development for Leishmaniasis** 89
Yasuyuki Goto

- 9 Siccanin Is a Novel Selective Inhibitor of Trypanosomatid Complex II (Succinate-Ubiquinone Reductase) and a Potent Broad-Spectrum Anti-trypanosomatid Drug Candidate 101**
 Nozomu Nihashi, Daniel Ken Inaoka, Chiaki Tsuge,
 Emmanuel Oluwadare Balogun, Yasutaka Osada, Yasuyuki Goto,
 Yoshitsugu Matsumoto, Takeshi Nara, Tatsushi Mogi,
 Shigeharu Harada and Kita Kiyoshi

Part III Diagnostic Strategy Enhancing Kala-Azar Elimination Program

- 10 Challenges in the Diagnosis of Visceral Leishmaniasis on the Indian Subcontinent. 125**
 Suman Rijal, François Chappuis, Jorge Alvar and Marleen Boelaert
- 11 Changes of *Leishmania* Antigens in Kala-Azar Patients' Urine After Treatment 135**
 Sharmina Deloer, Sohail Mohammad Samad, Hidekazu Takagi,
 Chatanun Eamudomkarn, Kazi M. Jamil, Eisei Noiri and Makoto Itoh
- 12 Potentiality of Urinary L-FABP Tests to Kala-Azar Disease Management 141**
 Eisei Noiri, Yoshifumi Hamasaki, Bumpei Tojo, Kazi M. Jamil,
 Kent Doi and Takeshi Sugaya
- 13 Antibody Capture Direct Agglutination Test (abcDAT) for Diagnosis of Visceral Leishmaniasis with Urine 161**
 Fumiaki Nagaoka, Hidekazu Takagi, Eisei Noiri and Makoto Itoh
- 14 Loop-Mediated Isothermal Amplification (LAMP): Molecular Diagnosis for the Field Survey of Visceral Leishmaniasis 167**
 Hidekazu Takagi, Makoto Itoh and Eisei Noiri
- 15 Applicability of Multiplex Real-Time PCR to Visceral Leishmaniasis. 173**
 Yoshifumi Hamasaki, Hirofumi Aruga, Chizu Sanjoba,
 Hidekazu Takagi, Shyamal Paul, Yoshitsugu Matsumoto
 and Eisei Noiri

Part IV Pathogenesis of Kala-Azar and PKDL

- 16 Immunoglobulins in the Pathophysiology of Visceral Leishmaniasis. 187**
 Satoko Omachi, Yoshitsugu Matsumoto and Yasuyuki Goto

Part V Knowledge and Practice for Vector Control in Kala-Azar

- 17 Geographical Distribution and Ecological Aspect
of Sand Fly Species in Bangladesh** 199
Yusuf Özbel, Chizu Sanjoba and Yoshitsugu Matsumoto
- 18 The Efficacy of Long Lasting Insecticidal Nets
for Leishmaniasis in Asia** 211
Chizu Sanjoba, Yusuf Özbel and Yoshitsugu Matsumoto

Part VI New Challenges in Kala-Azar Elimination Programme

- 19 Environmental Change and Kala-Azar with Particular
Reference to Bangladesh** 223
Ashraf Dewan, Masahiro Hashizume, Md. Masudur Rahman,
Abu Yousuf Md. Abdullah, Robert J. Corner,
Md. Rakibul Islam Shogib and Md. Faruk Hossain
- 20 Drug Safety Monitoring for Liposomal Amphotericin B** 249
Eisei Noiri and Kosuke Minami
- 21 High Resolution Mapping of Kala-Azar Hot Spots Using
GPS Logger and Urinary Antibody Measurements** 257
Bumpei Tojo, Makoto Itoh, Mohammad Sohel Samad,
Emi Ogasawara, Dinesh Mondal, Rashidul Haque and Eisei Noiri
- 22 Geography and Reality of Kala-Azar Endemic in Bangladesh,
Analysis Using GIS and Urine-Based Mass Screening** 271
Bumpei Tojo, Makoto Itoh, Shyamal Kumar Paul,
Mohammad Sohel Samad, Emi Ogasawara, Fumiaki Nagaoka,
Dinesh Mondal, Rashidul Haque and Eisei Noiri
- 23 Animal Models of Visceral Leishmaniasis and Applicability
to Disease Control** 287
Yasutaka Osada, Satoko Omachi, Chizu Sanjoba
and Yoshitsugu Matsumoto
- 24 Pharmacovigilance on Therapeutic Protocols for Visceral
Leishmaniasis** 297
Eisei Noiri, Bumpei Tojo, Yoshifumi Hamasaki, Masao Iwagami,
Takeshi Sugaya, Michiyo Harada, Progga Nath, Ariful Basher,
Dinesh Mondal, Rashidul Haque, Md Fashiur Rahman
and Shyamal Paul

Erratum to: Pharmacovigilance on Therapeutic Protocols for Visceral Leishmaniasis	E1
Eisei Noiri, Bumpei Tojo, Yoshifumi Hamasaki, Masao Iwagami, Takeshi Sugaya, Michiyo Harada, Progga Nath, Ariful Basher, Dinesh Mondal, Rashidul Haque, Md Fashiur Rahman and Shyamal Paul	
Index	307

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Abbreviations

ABC	ATP binding cassette
abcDAT	Antibody capture direct agglutination test
ACD	Active case detection
AIDS	Acquired immune deficiency syndrome
AKI	Acute kidney injury
ALT	Alanine aminotransferase
AMPH-B	Amphotericin B
Ampho	Amphotericin-B deoxycholate
ART	Anti retroviral therapy treatment
AST	Aspartate aminotransferase
ATP	Adenosine triphosphate
AUC	Area under curve
AVNIR-2	Advanced Visible and Near Infrared Radiometer-II
BAFF	B-cell activating factor
BCC	Behavior change communication
BCG	Bacille Calmette- Guerin
BMI	Body mass index
BUN	Blood urea nitrogen
CA	Circulating antigen
CCP	Cyclic citrullinated peptides
CDDP	<i>cis</i> -platinum
CI	Confidence interval
Cin	Inulin clearance
CKD	Chronic kidney disease
CL	Cutaneous leishmaniasis
COX2	Cyclooxygenase 2
CPB	Cysteine protease B
CPB	Cardio-pulmonary bypass surgery
CRP	C-reacting protein
DAT	Direct agglutination test

DCIP	2,4-dichlorophenolindophenol
DDM	<i>n</i> -dodecyl- <i>D</i> -maltoside
DDT	Dicophane (dichlorodiphenyltrichloroethane)
DGHS	Director General of Health Services
DNDi	The Drugs for Neglected Diseases <i>initiative</i>
DOT	Directly observed treatment
DSPG	Distearoyl phosphatidylglycerol
DTH	Delayed type hypersensitivity
ELISA	Enzyme-linked immunosorbent assay
ENSO	El Nino/Southern Oscillation
EVM	Environmental management
FABP1	Fatty acid binding protein 1
FAD	Flavin adenine dinucleotide
FFA	Free fatty-acids
FGS	Focal glomerular sclerosis
FGT	Formol gel test
FPF	False positive fraction
G3P	Glycerol 3-phosphate
G3PDH	Glycerol 3-phosphate dehydrogenase
GIS	Geographical Information System
GM-CSF	Granulocyte macrophage -colony stimulating factor
GPS	Geographical Positioning System
HHE	4-hydroxy-2- <i>hexenal</i>
HIF-1	Hypoxia inducible factor-1
HIV	Human immunodeficiency virus
HNE	4-Hydroxy-2,3-nonenal
HNF	Hepatocyte nuclear factor
HQNO	2-heptyl-4-hydroxyquinoline 1-oxide
hrCNE	High resolution clear native electrophoresis
HRE	Hypoxia responsive element
ICT	Immunochromatography
IEC	Information, education, communication
IFN- γ	Interferon- γ
IFN	Interferon
IFN γ	Interferon gamma
Ig	Immunoglobulin
IL	Interleukin
iNOS	Inducible nitric oxide synthase
IPCC	Intergovernmental Panel on Climate Change
IQR	Interquartile range
IRS	Indoor residual spraying
ITN	Insecticide-treated nets
KA	Kala-azar
KAMRC	Kala-azar Medical Research Center
KAtex	Latex agglutination test

kDNA	Kinetoplast DNA
kDNA	Kinetoplastid
KIM-1	Kidney inflammatory molecule-1
L-AMB	Liposomal amphotericin B
LAMB	Liposomal amphotericin B
LAMB	Liposomal formulations
LAMP	Loop-mediated isothermal amplification
LC-MS/MS	Liquid chromatography-mass spectrometry/ tandem mass spectrometry
LDU	Leishman Donovan units
L-FABP	L-type fatty acid binding protein, equivalent to FABP1
LLIN	Long-lasting insecticidal net
LnPCR	Nested PCR
LtSQR	SQR from <i>L. tarentolae</i>
MCL	Mucocutaneous leishmaniasis
MDRD	Modification of diet in renal disease study group
MKD	Milligram per kilogram of body weight daily
MMT	3-(4, 5-dimethyl-2-thiazolyl)-2, 5-diphenyl-2H-tetrazolium bromide
NADH	Nicotinamide adenine dinucleotide
NAG	N-acetyl- β -D-glucosaminidase
NDH2	Quinone reductase
NEHC	Non endemic healthy controls
NGAL	Neutrophil gelatinase-associated lipocalin
NO	Nitric oxide
NTDs	Neglected tropical diseases
PBS	Phosphate buffered saline
PCR	Polymerase chain reaction
PEG	Polyethylene glycol
PKDL	Post kala-azar-dermal leishmaniasis
PMS	Phenazinium methylsulfate
PMX-F	Polymyxin B-immobilized fiber
PPAR	Peroxisome proliferator activated receptor
RA	Rheumatoid arthritis
RBC	Red blood cells
RDT	Rapid diagnostic test
REC	Reticulo endothelial cell
RF	Rheumatoid factor
rKRP42	Recombinant kinesin related protein 42
RMRI	Rajendra Memorial Research Institute
RNA	Ribonucleic acid
RNase P	Ribonuclease P
ROC	Receiver operation curve
ROOH	Hydroperoxide radicals
RPPH1	Ribonuclease P RNA component H1

RT	Room temperature
SAG	Sodium antimony gluconate
Sb ^v	Pentavalent antimonial
SCr	serum creatinine
SD	standard deviation
SDH	succinate dehydrogenase
SDS-PAGE	sodium dodecyl sulfate-poly-acrylamide gel
SKKRC	Surya Kanta Kala-azar Research Center
SKKRC	Surya Kanto VL (Kala-Azal) Research Center
SLE	Systemic lupus erythematosus
SML	Sucrose monolaurate
SQR	Succinate-ubiquinone oxidoreductase, equivalent to succinate-ubiquinone reductase
SSG	Sodium stibogluconate
TAO	Trypanosoma alternative oxidase
TCA	Tricarboxylic acid
TcSQR	SQR from <i>T. cruzi</i>
TEM	Transmission electron microscope
TGF	Transforming growth factor
Th1	2T helper cell type 1, 2
TPF	True positive fraction
TTFA	Thenoyltrifluoroacetone
UHC	Upazila Health Complex
UQ ₁	Ubiquinone 1
VL	Visceral leishmaniasis
VLEP	VL Elimination Program
WHO	World Health Organization
WHOPES	WHO Pesticide Evaluation Scheme
α1MG	α ₁ -microglobulin
β2MG	β ₂ -microglobulin