

# Indian Council of Medical Research (ICMR)

Deptartment of Health Research
(Ministry of Health and Family Welfare)

### **Investigator-Initiated Research Proposals**

Date of submission: 28-Apr-2023 11:49:03 AM

Proposal Id: IIRP-2023-4691, Version Id: F1, Proposal Title: A comparative multicentric non inferiority clinical trial of WHO MBMDT with a new monthly chemotherapy regime containing Rifampicin, Moxifloxacin and Clarithromycin (RMC) on Multibacillary patients from India.

Personal Details of PI								
Name of PI (IN BLOCK LETTERS)	DR JOYDEEPA DARLONG	Designation	Head					
Email	JOYDEEPA.DARLONG@LEPROSYMISSION.IN	Contact	9434885198					
Date of Birth	28-Oct-1968	Date of Superannuation	27-Oct-2028					
Nature of Employment	Permanent	Institute	The Leprosy Mission Hospital					
	Proposal Detail:	S PART-A						
Advertisement	Call for Investigator-Initiated Research Proposals for small extramural grants	Institute	The Leprosy Mission Hospital					
Institute Type	NGO Darpan ID: 5897	Valid DSIR Certificate (Validity)	YES (31-Mar-2025)					
Title of the proposed research project	A comparative multicentric non inferiority clinical tria Rifampicin, Moxifloxacin and Clarithromycin (RMC)		, ,, ,					
Summary (up to 250 words): A structured summary should contain the	Rationale/gaps in existing knowledge: Current WHO a subset of patients harboring a large bacterial load in some countries. The duration of MDT is long and	thus continuing transmission	of the disease responsible for endemicity					

Summary (up to 250 words): A structured summary should contain the following subheadings: Rationale/ gaps in existing knowledge, Novelty, Objectives, Methods, and Expected outcome.

limited evidence support resulting in multiple reformulations since the last 40 years. This calls for a search for newer, more efficacious drugs with shorter duration of action evidenced with well-designed clinical trials. Novelty: Relapse, advocated as the key outcome measure of efficacy of MDT, has its drawbacks. Relapse studies require long years of follow up. The gold standard test for viability was Mouse foot pad studies which is costly and time consuming. Hence, we propose Molecular Viability Assays as outcome measure of efficacy which are newer and better techniques to test viability faster. Objectives: To determine the efficacy of monthly regimen of Rifampicin, Moxifloxacin and Clarithromycin (RMC) regimen as compared to WHO MBMDT regarding clinical cure, lab parameters, immunological reactions, Viability assays, Mouse Foot pad studies and acceptability to the patient in Multibacillary leprosy patients. Methods: It is an open label randomized clinical control trial where in the intervention group monthly supervised regimen of Rifampicin, Moxifloxacin and Clarithromycin will be administered in doses of 600 mg, 400 mg, and 1000 mg respectively and the control arm would be given routine WHO MB MDT. The duration of the treatment in both arms will be 12 months. The random sequence will be generated centrally which will be sent to study centres in opaque envelopes. After consent approved, the envelope will be opened, and patient put on respective arms. The study population will include newly diagnosed, previously untreated MB leprosy patients. Written informed consent will be sought from every subject included in the study. SSS of all the study subjects will be collected at 0day, 6th, 12th, and 24th month and transported in RNAlater to the SBL. Real Time PCR will be done to quantitate copy numbers of the genes encoding 16S rRNA, hsp18 and esxA specific for M. leprae. Resistance studies will be carried out at 12 months in patients harbouring viable bacilli. Validation of M. leprae growth in mouse foot pad will be performed on participants showing viable load by molecular method at the time of RFT in Schieffelin Institute of Health – Research and Leprosy Centre Karigiri (SIHR&LC), Vellore. Expected outcome: Primary efficacy outcomes: 1. Molecular I. Reduction of copy numbers by MVA II. Complete killing of M. leprae as demonstrated in MFP. 2. Clinical I. Complete clinical cure, defined as full regression of the lesions. II. Clinical improvement of the lesions defined by a clinical criterion 3. Pathological I. Bacillary index (BI) improvement 3. Secondary Efficacy outcomes include: 1. Immunological outcomes Neuritis - if participants reported pain during the interview or when Nerve function impairment is detected on routine test. Type I reaction Type 2 reaction 2. Safety outcomes Severe side effects (defined as a side effect that forced the patient to stop the treatment), mild to moderate side effects. 3. Qualitative outcomes Impact of leprosy treatment on life Perspective towards leprosy treatment

<b>Priority Area:</b> Communicable Diseases	Priority Area diseases: One-health	Area of Research	Development	
<b>Keywords</b> Six keywords separated by comma which best describe your project may be provided.	Leprosy, MDT, alternate regime , clinical tria	al		
Abbrevations Only standard abbreviations should be used in the text. List of abbreviations maximum of ten may be given as a list.	MDT: multidrug therapy MVA: Molecular via	ability assay MFP: mouse foot pad		
Problem Statement (up to 500 words): State the currently available information to present the problem adequately.	of MDT is long and promotes noncompliand multiple reformulations since the last 40 years.	ssion of the disease responsible for ce.MDT continues to be controversia ars. This calls for a search for newer	endemicity in some countries. The duration all with limited evidence support resulting in	
Hypothesis/ Research question (up to 100 words): Please provide details	Research Question: Is Monthly Rifampicin, patients affected by multibacillary leprosy?	Moxifloxacin and Clarithromycin as	efficacious and safe as WHO MBMDT in	
Study Objectives (up to 25 words/ objective) Define the objectives clearly and in measurable terms;	To determine the efficacy of monthly regime to WHO MBMDT.  None  None	en of Rifampicin, Moxifloxacin and C	clarithromycin (RMC) regimen as compared	

None

mention as primary and

secondary objectives, if necessary. Do not include more than 3-4 objectives.

	Study Design	Study Site	Methods (e.g. PICO)	Sample Size	Implementation Strategy	Statistical analysis	Ethical issues
1	It is an open	Four tertiary care	Proposed study design It is an open label	Since there are no previous	Data collection will be done at	The primary objectives of	Participants will
	randomized	hospitals	randomized clinical	studies that	four tertiary care	the	from TLMTI
	clinical control	from The	control non inferiority	gives the	hospitals from	statistical	hospitals, 4 TLN
	non inferiority	Leprosy	trial where in the	effectiveness	The Leprosy	analyses are	hospitals from
	trial where in	mission Trust	intervention group	of the new	mission Trust	to evaluate	Purulia, West
	the intervention	India	monthly supervised	drug	India (TLMTI).	the efficacy	Bengal,
	group monthly	(TLMTI).	regimen of Rifampicin,	Rifampicin,	They are TLM	and safety	Chandkhuri,
	supervised	They are	Moxifloxacin and	Moxifloxacin	Purulia in West	of the trial	Chattisgarh,
	regimen of	TLM Purulia	Clarithromycin will be	and	Bengal, TLM	drugs. The	Shahdara, Delh
	Rifampicin,	in West	administered in doses of	Clarithromycin	Chandkhuri,	efficacy	and Barabanki,
	Moxifloxacin	Bengal, TLM	600 mg, 400 mg, and	(RMC) over	Chhattisgarh,	analysis will	UP. Informed
	and	Chandkhuri,	1000 mg respectively	the standard	TLM Shahdara,	be	written consent
	Clarithromycin	Chhattisgarh,	and the control arm	regimen WHO	Delhi and TLM	conducted in	for participation
	will be	TLM	would be given routine	MBMDT. The	Barabanki, UP.	the intent-to-	following the
	administered in	Shahdara,	WHO MB MDT for 12	sample size	Molecular	treat	ethical
	doses of 600	Delhi and	months. Research	will be	viability assays	population,	guidelines of th
	mg, 400 mg,	TLM	Participants Inclusion	calculated	and resistance	safety	Indian council
	and 1000 mg	Barabanki,	Criteria: Never treated,	based on the	testing will be	analysis will	Medical
	respectively	UP Stanley	Age 15 and above	researcher's	done the	be	Research
	and the control	Browne	patients with	clinical	Stanley Browne	conducted in	(ICMR) and the
	arm would be	laboratory of	Multibacillary (MB)	experience.	laboratory of	the safety	Institutional
	given routine	TLMTI	leprosy, defined as 5 or	Treatment	TLMTI located	population.	Ethical
	WHO MB MDT.	located at	more skin lesions or	efficacy is	at TLM	The	Committee of
	The duration of	TLM	extensive infiltration and	measured	Shahdara	independent	TLMTI, will be
	the treatment in	Shahdara	/or diffuse skin	basedon the	Hospital at	t test or	sought from all
	booth arms will	Hospital at	involvement, classified	reduction in	Delhi. Mouse	Mann-	the participants
	be 12 months.	Delhi.	as borderline	the	foot pad	Whitney test	enrolled in the
	The random		tuberculoid, borderline	bacteriological	analysis will be	will be used	study. All
	sequence will		lepromatous or polar	lesions. The	conducted at	to compare	correspondence
	be generated		lepromatous, as	sample size	SIHR&LC,	the outcome	with ethics
	centrally which		determined using Ridley	needed to	Karigiri, Vellore	between	committees wil
	will be sent to		and Jopling	estimate the	A Trial	study arms.	be filed at TLM
	study centers in		classification system.	effectiveness	Management		by the trial
	opaque		Exclusion Criteria:	of the new	Group (TMG)		management
	envelopes.		History of intolerance to	drug	will be appointed		team in the tria
	After consent		one of the medications.  Patients who are not	Rifampicin,	and will be		management
	approved, the envelope will be		able to come to the	Moxifloxacin and	responsible for overseeing the		file. Annual progress repor
	opened, and		clinic every month	Clarithromycin	progress of the		and notification
	patient put on		during their treatment	(RMC), with	study. The day-		of end of study
	respective		and during follow up.	80% to 95%	to-day		will be submitte
	arms. The study		Patients who do not	reduction in	management of		to all the ethics
	population will		give informed consent	the	the trial will be		committees wh
	include newly		or are not capable to	bacteriological	coordinated		have granted
	diagnosed,		give informed consent	lesions (BL)	through the		approval for the
	previously		due to mental	due to	Study		study.
	untreated MB		impairment.	treatment. With	Coordination		,
	leprosy		Immunocompromised	alpha-error of	Centre.		
	patients.		patients diagnosed with	5%, power of			
	Written		HIV/AIDS and	80% and Non-			
	informed		Tuberculosis. Sampling	cooperation			
	consent will be		Strategy: Interventional	rate of 10%,			
	sought from		clinical trial where	and2-sided			
	every subject		Participants will be	test was			
	included in the		randomly allocated to	considered.			
	study. Slit Skin		one of the two study	With a risk			
	Smears of all		arms using	difference 15%			
	the study		randomization tables	, the required			
	subjects will be		provided by the	sample size is			
	collected at 0-		statistician, intervention	140 in each			
	day, 6th, 12th		model will be parallel	arm .			

# Study Design Study Site Methods (e.g. PICO) Sample Size Strategy analysis  SBL. Real Time	Ethical issues
PCR will be treatment. One arm will done to receive routine WHOMB quantitate copy MDT, and the other arm numbers of the will receive the RMC genes encoding (Rifampicin, 165 rRNA, Moxifloxacin and hsp18 and Clarithromycin) exsA specific regimen, Purposive for M. leprae. sampling for the Resistance qualitative aspect of the studies will be trial - Participants who carried out at both have consented for 12 months in follow up and who are patients (a) trending to positive harbouring change on the outcome viable bacilli. measures AND (b) Validation of M. trending to no change (or negative change on mouse foot pad the outcome measures). will be Sampling these groups performed on across the 2 participants intervention arms. showing viable Therapy Regimen: Arm load by 1 - WHO MB MDT containing Rifampicin method at the 600 mg, Clofazimine 50 and lnstitute of Dapsone 100 mg daily x Health — 12 months. Arm 2 -	
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Institute of Dapsone 100 mg daily x Health – 12 months. Arm 2 -	
Health – 12 months. Arm 2 -	
Research and Once a Month	
Leprosy Centre supervised regimen	
Karigiri containing Rifampicin	
(SIHR&LC), 600 mg, Moxifloxacin	
Vellore. 400 mg, Clarithromycin	
1000 mg for 12 months.	
2 N/A N/A N/A N/A N/A	N/A
3 N/A N/A N/A N/A N/A	N/A
4 N/A N/A N/A N/A N/A	N/A
Primary efficacy outcomes: 1. Molecular I. Reduction of copy numbers by MVA II. Complete killing of M. demonstrated in MFP. 2. Clinical I. Complete clinical cure, defined as full regression of the lesions. II. Cli of the lesions defined by a clinical criterion 3. Pathological I. Bacillary index (BI) improvement II. Improve Secondary Efficacy outcomes include: 1. Immunological outcomes Neuritis - if participants reported pain interview or when Nerve function impairment is detected on routine test. Type I reaction Type 2 reaction improvement in severity score between the 2 regimes. 2. Safety outcomes Severe side effects (defined forced the patient to stop the treatment), mild to moderate side effects. 3. Qualitative outcomes Impact of on life Perspective towards leprosy treatment Cost of treatment.	linical improvemer yed biopsy findings n during the n – Incidence and l as a side effect th
ture plan based on Studies on efficacy of the new drug on immunological reactions and relapses will be undertaken in subsepected outcomes	sequent studies.
nether the study is None ing to generate new ellectual property	
nelines with <u>View</u>	

#### Proposal Details PART-B

#### Preliminary work done by the PI including the source of funding (up to 250 words):

The PI has undertaken a multicentric clinical trial of azathioprine vs prednisolone in type 1 reactions and neuritis funded by the Welcome trust and partnered with London School of Tropical hygiene and medicine. She is the PI of a current Trial of methotrexate vs prednisolone in type 2 reactions in leprosy.

# Skill and experience of the research team

Highlight only salient points (along with 5 relevant publications) that provides confidence to reviewers that team can implement the project with quality. The research team has implemented multiple clinical studies including trials. They have won proposal grants in competitive call for grants, with appropriate registration in ethics board and CTRI. Data is collected on Redcap and all research staff have Good clinical practice certification. Training in data management and ethical principles are mandatory. The hospitals have well equipped lab and impaging facilities with quality medical and surgical and dermatological expertise that can manage adverse events if any. A robust monitoring system is in place with monthly monitoring meetings and face to face mid year and annual reviews for all research projects in the organization. Lockwood DN, Darlong J, Govindharaj P, Kurian R, Sundarrao P, John AS. AZALEP a randomized controlled trial of azathioprine to treat leprosy nerve damage and Type 1 reactions in India: Main findings. PLoS Negl Trop Dis. 2017 Mar 30;11(3):e0005348. doi: 10.1371/journal.pntd.0005348. PMID: 28358815; PMCID: PMC5373510. de Barros B, Lambert SM, Shah M, Pai VV, Darlong J, Rozario BJ, Alinda MD, Sales AM, Doni S, Hagge DA, Shrestha D, Listiawan MY, Yitaye AM, Nery JAC, Neupane KD, Dias VLA, Butlin CR, Nicholls PG, Lockwood D, Walker SL. Methotrexate and prednisolone study in erythema nodosum leprosum (MaPs in ENL) protocol: a double-blind randomised clinical trial. BMJ Open. 2020 Nov 17;10(11):e037700. doi: 10.1136/bmjopen-2020-037700. PMID: 33203627; PMCID: PMC7674097. Walker, S. L., Balagon, M., Darlong, J., Doni, S. N., Hagge, D. A., Halwai, V., ... & Erythema Nodosum Leprosum International STudy Group. (2015). ENLIST 1: an international multi-centre cross-sectional study of the clinical features of erythema nodosum leprosum. PLoS neglected tropical diseases, 9(9), e0004065. Lavania M, Darlong J, Reddy A, Ahuja M, Singh I, Turankar RP, Sengupta U. Successful treatment of rifampicin resistant case of leprosy by WHO recommended ofloxacin and minocycline regimen. Leprosy Review. 2019 Dec 1;90(4):456-9. Lavania M, Singh I, Turankar RP, Ahuja M, Pathak V, Sengupta U, Das L, Kumar A, Darlong J, Nathan R, Maseey A. Molecular detection of multidrug-resistant Mycobacterium leprae from Indian leprosy patients. Journal of global antimicrobial resistance. 2018 Mar 1;12:214-9.

# Institutional Support/ Facilities

The activities planned in the study will be conducted at the leprosy mission trust india. There are 14 tertiary care hospitals for leprosy and 4 high burden centres have been chosen to enable timely recruitment and data collection. The Staley Browne lab is the research laboratory with accreditation from the DSIR and has held many ICMR grants including 2 currently. There is a robust system of sample flow from hospitals to the lab for early diagnostic studies and antimicrobial resistance. Reporting is done online and hard copy is posted to the respective centres. There is a whatsapp group of doctors as a community of practice that discusses complicated case management. Each medical officer undergoes a 5 day training program to manage leprosy at The training unit at Naini , Prayagraj ensuring the protocols and management details are learnt by the doctors. The hospitals have lab , physio , counselling , pharmacy , footwear , aids and appliance departments to facilitate any clinical study.

#### Laboratory facilities (invitro/ in-silico) Institutional resources such as instruments/ equipment and other physical resources available for use in the project proposed animal house etc.

Laboratory is equipped with Biosafety Level cabinets, Tissue culture facility, Qubit, Spectrophotometer, PCR, Real time PCR, Thermocyclers, Deep freezers (-20 and -80), Incubators (Shaking as well), CO2 incubator, Western blotting, SDS PAGE electrophoresis, 2-D gel electrophoresis, Agarose Gel electrophoresis, ELISA Readers, Chemi-Doc as well as other small centrifuges, refrigerators etc.

# Conflict of Interest declaration (if any)

None

**Duration (in Months)** 

36 Months

#### **Investigator Details**

#	Name	Institute	Designation	Email	Contact No.	Role in Proposal
1	Dr Joydeepa Darlong	The Leprosy Mission Hospital	Head	joydeepa.darlong@leprosymission.in	9434885198	PI
2	Dr Itu Singh	The Leprosy Mission Hospital	Head	itusingh@gmail.com	9717730549	Co-PI
3	Dr Reeta Devi	The Leprosy Mission Hospital	Consultant	rits2gmc@gmail.com	6006203600	Co-PI

### Documents consideration

#	Document Name	Uploaded Document	Remarks	Action
1	Revised Budget	<u>View</u>	We have 4 research sites – each site contributing 70 trial participants to be recruited in 12 months. We have budgeted for 3 RA's for 3 sites and the SRF who is the trial coordinator will execute the functions of the RA for 4th site as well as coordinator for all 3 sites. It is very difficult to reduce the number of RA's from any one site – otherwise the implementation of the trial will be stagnated or compromised. Unless one designated staff is present per trial site, quality implementation will be compromised. Hence, we are requesting the budget remain the same.	
2	Declaration & Attestation Form(duly signed by Head of Department/ Director)	<u>View</u>	Declaration form	
3	Additional supplementary information including figures tables flow diagrams etc can be shared as PDF (20-30 KB)	<u>View</u>	Flow diagram of the study	
4	Declaration & Attestation Form(duly signed by Head of Department/ Director)		Declaration	
5	Additional supplementary information including figures tables flow diagrams etc can be shared as PDF (20-30 KB)		work flow	

# **Budget Details**

Year	Institute Name	Manpower	Contingency	Equipment	Travel	Overhead Charges	Total Budget (Rs.)
Year: 1	The Leprosy Mission Hospital	2,378,520.00	770,000.00	0.00	100,000.00	83,340.00	3,331,860.00
Year: 2	The Leprosy Mission Hospital	2,378,520.00	1,570,000.00	0.00	100,000.00	107,340.00	4,155,860.00

# Budget Breakup Details (Staff/Manpower)

#	Budget Year	Institute	Designation	No. of Person(nos)	Require Month(nos)	Cost Per Person(Rs.)	Total Cost(Rs.)
1	Year: 1	The Leprosy Mission Hospital	Senior Research Fellow	1	12	44,450	533,400.00
2	Year: 1	The Leprosy Mission Hospital	Project Assistant	4	12	38,440	1,845,120.00
3	Year: 2	The Leprosy Mission Hospital	Senior Research Fellow	1	12	533,400	533,400.00
4	Year: 2	The Leprosy Mission Hospital	Project Assistant	4	12	38,440	1,845,120.00

Total (Rs.): 4,757,040.00

### Budget Breakup Details (Contingency)

#	Budget	Institute	Contingency Name	Total	Justification
	Year			Cost(Rs.)	
1	Year: 1	The Leprosy Mission Hospital	Mouse Foot Pad test	30,000.00	Mouse foot pad: Gold standard method to find out the viability of M. leprae
2	Year: 1	The Leprosy Mission Hospital	Histopathology	30,000.00	Histopathology: Sections of the skin biopsies will be examined by hematoxylin and eosin (H&E) staining and modified Fite-Faraco technique for M.leprae.
3	Year: 1	The Leprosy Mission Hospital	Real Time PCR test	100,000.00	Real Time PCR reagents: To quantify viable M. leprae.
4	Year: 1	The Leprosy Mission Hospital	Blood test	500,000.00	Blood test will be done for all the study subjects for the study duration.
5	Year: 1	The Leprosy Mission Hospital	Drugs cost	90,000.00	Rifampicin, Clarithromycin and Moxifloxacin for all the study subject
6	Year: 1	The Leprosy Mission Hospital	Sample collection from TLMTI	20,000.00	Sample collection: RNAlater in which RNA can be stabilized and transported at room temperature from field.
7	Year: 2	The Leprosy Mission Hospital	Drugs cost	82,680.00	Rifampicin, Clarithromycin and Moxifloxacin for all the study subject
8	Year: 2	The Leprosy Mission Hospital	Sample collection from TLMTI	20,000.00	Sample collection: RNAlater in which RNA can be stabilized and transported at room temperature from field.
			Total (Rs.):	872.680.00	

Total (Rs.): 872,0

872,680.00

# Budget Breakup Details (Equipment)

#	Budget Year	Institute	Equipment Name	Equipment Model	Equipment Manufacturer	Equipment Type	Total Cost(Rs.)	Justification

No Record

## Declaration

I hereby declare that the entries in this form and the additional particulars, if any, furnished herewith are true to the best of my knowledge and belief. I understand that in the event of my information being found false or incorrect at any stage, my project/proposal shall be liable to cancelation / termination without notice or any compensation in lieu thereof.