Annual Report 2019-2020

ICMR-Regional Medical Research Centre, Gorakhpur

1. Ongoing Projects

Diagnostic services for suspected Japanese encephalitis (JE) cases from eastern Uttar Pradesh.

ICMR-RMRC Gorakhpur, undertake the routine investigation of clinically suspected Acute Encephalitis Syndrome (AES) cases admitted to the BRD Medical College (BRDMC), Gorakhpur and provides diagnostic services that guide the management of cases.

- A total of 1093 clinical specimens (CSF and Serum) were collected from 574 AES cases.
- All the AES cases hospitalized during (1st April 2019 to 31st March 2020) were investigated for detection of anti-*Japanese encephalitis (JE)* virus specific IgM (anti-JE IgM), anti- *Orientia tsutsugamushi* IgM (anti - OTs IgM) and Dengue NS-1 antigen (DEN NS-1 Ag) by ELISA assays as per the ICMR recommendations.
- Anti-OTs IgM positivity was recorded in 349 cases (61.7%) followed by anti-JE IgM in 104 cases (18.4%) and 18 cases (3.1%) for DEN NS-1 antigen.

Setting up of AES Cell at Baba Raghav Das Medical College, Gorakhpur.

AES cell is established in the Pediatric ward of the BRD Medical College to co-ordinate the specimen collections, storage, laboratory testing, clinical data collection and analysis.

- Scrub typhus has been associated as the major etiology with AES cases of eastern Uttar Pradesh.
- The genetic sequence analysis confirmed Gilliam genotype is the most prevalent genotype in this area comprising about 90 % and the karp genotype is about 10 %. of *Orientia tsutsugamushi* (Scrub typhus pathogen).

Genetics of susceptibility to encephalitis in Japanese encephalitis virus infected children from Uttar Pradesh.

A total number of 403 healthy controls without any history of encephalitis and 237 encephalitis cases positive for JEV by IgM ELISA /PCR were included in this study.

- The results revealed a significantly higher frequency of *TNFA* rs1800629 G/A, *IFNG* rs2430561 A/T, *CD209* -336 A/G and *MMP9* Q279R G/A genotypes among JE cases as compared to healthy controls.

Etiological investigations of non-AES referred cases from Gorakhpur region.

A total of 124 whole blood specimens of Dengue fever suspected cases were obtained from Gorakhnath Hospital, Gorakhpur.

- In these samples PCR based genotyping of Dengue virus revealed that circulation of DV-1, 2 and 3 serotypes in this region.

Establishment of a Health and Demographic Surveillance System [HDSS], Gorakhpur, Uttar Pradesh.

- Basic demographic data collection of 9 villages of the total 28 villages has been completed covering 8402 household and 46360 household members.
- GIS based mapping of HDSS area has been completed.

Development of diagnostic kit for rapid and early detection of *Orientia tsutsugamushi* based on isothermal recombinase polymerase amplification and lateral flow.

- The 56kDa gene of Karp and Gilliam strains of *O.tsutsugamushi* were successfully isolated from blood samples of acute encephalitis cases.
- Optimization of isothermal recombinase polymerase amplification has also been initiated using the cloned full length 56kDa gene *O.tsutsugamushi* and with specifically designed primer sets.

Assessment of lymphatic filariasis transmission after post mass drug administration in Gorakhpur district.

Gorakhpur district is listed as endemic district of lymphatic filariasis by NVBDCP. Secondary data collection regarding prevalence of lymphatic filariasis patient in Gorakhpur district was under progress with the state health department authorities.

- Finalization of study villages from 19 administrative blocks of this district was completed.
- *Culex quinquefasciatus* mosquito collection was completed from three administrative blocks of Gorakhpur District.

National Survey for state wise prevalence of microbiologically confirmed pulmonary tuberculosis in India.

This tuberculosis prevalence survey in various districts of eastern Uttar Pradesh was started was started on 05/12/2019.

- This project covers 21 districts and 34clusters the eastern Uttar Pradesh.
- Four clusters were completed from three districts of this region.

A study of psycho-neurotic disorders and socio - behavioral changes among AES/JE cases recovered in Gorakhpur.

- This study was initiated in January 2020; finalization of protocols and collaboration with different agencies is under progress.

Study on Current Status of General Public Health Problems and Level of Health Awareness in Gorakhpur.

- The field study has been conducted on 500 participants from 10 HDSS villages.

2. Major achievements having public health importance

- Initiation of laboratory testing facility of clinical specimens of suspected cases of nCov-19 as per ICMR guidelines.
- Infrastructure for molecular and serological laboratory diagnosis for associated etiologies of acute encephalitis syndrome as per ICMR algorithm.
- Infrastructure and lab were established for the study of Anti Microbial Resistance (AMR) and Malaria diagnosis.
- Health awareness & hand hygiene awareness program for school children
- IEC activities & pamphlets on Health awareness and awareness on JE/AES were distributed in the villages of HDSS site on daily basis.
- Distribution of infographics on JE / AES awareness in 28 HDSS villages (> **3000 families**).
- Formulation and distribution of infographics (pamphlets) on **SWACHCHHATA & HEALTH HYGENE** as part of Swachchha Bharat Abhiyan in HDSS villages (>1200 families).
- **Organizing health awareness camps** for general public (social, psychological and physical health) in endemic villages of JE/AES in Gorakhpur division.
- An ICMR Training on **Biomedical and Health Research Ethics** was conducted in collaboration with ICMR-NCDIR Bangalore and BRD Medical College, Gorakhpur. More than 200 participants from various parts of country have been participated.
- **Memorandum of Understanding (MOU)** was made between ICMR-RMRC, Gorakhpur and DDU Gorakhpur University to develop academic exchanges and cooperation in teaching and research in furtherance of the advancement and dissemination of learning.
- **Stake holder's consultation on AES/JE** was organized with state health officials to focus research work on regional health issues.

3. Future Plans

- Establishment of HDSS site, follow up and creation of a biorepository.
- Hospital based surveillance of respiratory pathogens in children below 5 years in Gorakhpur region
- Assessment of genomic diversity among the SARS-CoV-2 and the clinical outcomes in the infected migrant laborers returning to Eastern U.P.
- Development of isothermal recombinase polymerase amplification and lateral flow based diagnostic kit for rapid and early detection of *Orientia tsutsugamushi* (scrub typhus pathogen).
- Design interventions based on the health care seeking behaviour which will be useful for monitoring the progress to the TB Control at state level.
- AMR study of the most prevalent nosocomial pathogens of this region.
- To estimate the Malaria and other vector borne diseases burden of this region.
- Planning of training and capacity building program for state health department staff on field survey and laboratory diagnosis of vector borne diseases.
- Multi-centric extramural project to be conducted to on covid-19 pandemic on the topic of "Factors related to Covid-19 Stigma."

- A qualitative “study on psycho-social issues and challenges of individuals diagnosed with Covid-19 in eastern Uttar Pradesh” to be conducted in view of Covid-19 pandemic.

4. Photo Gallery

A. Health Awareness Camps in disease endemic villages

B. Distribution of infographics on SWACHCHHATA & HEALTH HYGENE

C. Training program on Biomedical and Health Research Ethics

5. Annexure I: Publications

1. Effectiveness of Presumptive Treatment of Acute Febrile Illness with Doxycycline or Azithromycin in Preventing Acute Encephalitis Syndrome in Gorakhpur, India: A Cohort Study. Jeromie Wesley Vivian Thangaraj, **Kamran Zaman**, Vishal Shete, **Ashok Kumar Pandey**, Saravanakumar Velusamy, Avinash Deoshatwar, Mahima Mittal, Nivedita Gupta, Manoj Murhekar. Indian Pediatr. 2020 Jul 15;57(7):619-624. Epub 2020 Mar 12. **(Impact factor:1.1)**

2. Sequelae Following Acute Encephalitis Syndrome Caused by Orientia Tsutsugamushi. Surya Prakash Gangwar, Jeromie Wesley Vivian Thangaraj, **Kamran Zaman**, Vignesh Vairamani, Mahima Mittal, Manoj Murhekar. Pediatr Infect Dis J. 2020 May;39(5):e52-e54. **(Impact factor:2.7)**

3. Association of single nucleotide polymorphisms in TNFA and CCR5 genes with Japanese Encephalitis: A study from an endemic region of North India.**Deval H,** Alagarasu K, Mittal M, et al., J Neuroimmunol. 2019;336:577043. doi:10.1016/j.jneuroim.2019.577043 **(Impact Factor: 2.5)**
4. Deoshatwar AR, Mittal M, **Behera SP**, **Kumar N** , **Misra BR**, **Deval H**, Bondre VP**.** A case of primary vzv hemiparesis and rapidly progressive fatal neurological complications in an immuno-competent eight year old girl. Nat.Medical Journal India (Accepted) **(Impact Factor: 0.6)**
5. **Deval H**, **Behera SP**, Agrawal A, **Singh R**, **Misra BR**, Janardhan V, Patil G, **Sah K**, **Kumar N**, Bondre VP. Genetic characterization of dengue virus serotype 2 isolated from dengue fever outbreaks in eastern Uttar Pradesh and western Bihar, India. J Med Virol. 2020. doi: 10.1002/jmv.26239..PMID: 32633814 **(Impact Factor: 2.049)**
6. A Comparative Review on Current and Future Drug Targets Against Bacteria & Malaria.Rout UK, Sanket AS, Sisodia BS, Mohapatra PK, Pati S, Kant R, **Dwivedi GR***. 2020. *Current Drug Targets*. 21(8):736-775. (**Impact factor- 3.122)**.
7. In-silico Druggability Studies of 4-hydroxy-α-tetralone and its Derivatives with RND Efflux pump of *E. coli*. Singh S, Sanket AS, **Dwivedi GR**, Upadhyay HC.2020. Pharmaceutical and Biosciences Journal Vol. 8(2), 21-26.
8. ***Guest Editor*** of thematic issue **Dwivedi GR** *"**Role of botanicals/endophytic compounds in modulation of multidrug transporters"** Current Topics in Medicinal Chemistry*, 19(10): 753. (**Impact factor- 3.442)**.
9. **Dwivedi GR**, Maurya A, Yadav DK, Tewari N, Pal A, Khan F, Srivastava SK, Darokar MP. 2019 *Current Topics in Medicinal Chemistry*. 19(10): 847-860. doi: 10.2174/1568026619666190412120008. **(Impact factor- 3.442)**.
10. Comparative Drug Resistance Reversal Potential of Natural Glycosides: Potential of Synergy Niaziridin & Niazirin, **Dwivedi GR**, Maurya A, Yadav DK, Singh V, Khan F, Srivastava SK, Darokar MP. 2019. Synergy of clavine alkaloid 'chanoclavine' with tetracycline against multi drug resistant E. coli. Journal of Biomolecular Structure and Dynamics. 37(5):1307-1325. (**Impact factor- 3.310)**.
11. Therapeutic Potential of Endophytic Compounds: A Special Reference to Drug Transporter Inhibitors. Singh K, **Dwivedi GR***, Sanket AS, Pati S. 2019. *Current*

Topics in Medicinal Chemistry. ***19(10): 754 - 783.*** doi: 10.2174/1568026619666190412095105**.** (**Impact factor- 3.442)**.

12. Secondary metabolites: Metabolomics for secondary metabolite. In New and Future Developments in Microbial (Bio)-technology and Bioengineering: Microbial Secondary Metabolites Biochemistry and Applications,**Dwivedi GR**, Sisodia BS, Shikha. 2019. V. Gupta & A. Pandey Edi.; Elsevier publication, Radarweg 29, PO Box 211, 1000 AE Amsterdam, Netherlands. DOI: https://doi.org/10.1016/B978-0-444-63504-4.00022-0 ISBN: 9780444635044. pp 333-344.
13. Singh K, Mohapatra PK, Pati S, **Dwivedi GR***. 2019. *Genetics and Molecular Biology of Genes Encoding Cephalosporin Biosynthesis in Microbes*. In New and Future Developments in Microbial (Bio)-technology and Bioengineering: Microbial Genes Biochemistry and Applications. H.B. Singh, V. Gupta, & Edi.; Elsevier publication, Elsevier publication, Radarweg 29, PO Box 211, 1000 AE Amsterdam, Netherlands. DOI: https://doi.org/10.1016/B978-0-444-63503-7.00002-4. ISBN: 9780444635037, pp. 25-34.
14. Stress among Workers in Diamond Cutting and Polishing Occupations.**Yadav, G. K.**, Kumar, S. and Mishra M. R. (2019). *Indian Journal of Occupational and Environmental Medicine.* 23, 3-6. (**Impact Factor 0.42)**. ISSN-0973-2284.
15. Anxiety among Workers in Diamond Cutting and Polishing Industry.**Yadav, G. K**., Kumar, S. and Mishra M. R. (2019). *International Journal Social Sciences Review*. 7 (5-III), 1543-1546. (**Impact Factor: 5.83)** (Hard ISSN: 2229-5356)