

List of completed projects in Medical Sciences during the year 2010 - 2011

Title of Research Scheme / Project : Health risk assessment and environmental monitoring among pesticide sprayers in Mango plantations of Uttar Pradesh

Name & Institution of the Principal Investigator : Dr. C. Keshavchandran,
Scientist E-I, PI,
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Duration : 03 years

Significant findings/Conclusions:

This project aims to study the health profile of sprayers in mango orchards exposed to pesticides, and to analyze the pesticide residues in air, water, soil, and fruit samples and the total suspended particle respirable dust concentrations in the environmental conditions due to exposure of pesticides. Health survey including clinical and sub-clinical examination among pesticide sprayers of Malihabad and Bakshi Ka Talab show health problems related to pesticide toxicity and the personal habits like smoking, tobacco chewing, alcohol users were common among sprayers. No statistically significant difference was observed in clinical studies, lung function studies, nerve conduction studies, haematological studies and cholinesterase activity between pre and post spraying season for clinical lung function, nerve conduction, cholinesterase activity and haematological studies in pesticide sprayers. α -HCH, γ -HCH, δ -HCH, total HCH, op DDT were detected in blood of sprayers. Air monitoring of pesticides at mango orchards shows four isomers of organochlorine pesticides (α -HCH, Lindane, δ -HCH, op DDT in air. The results showed higher prevalence of symptoms pertaining to musculo-skeleton system, respiratory problems, higher count of haematological parameters like WBC, monocyte, neutrophil, decreased Lower airway obstruction (FEV1) and Upper airway obstruction (PEFR) and slowing of Sensory Nerve Conduction Velocity (SNCV), pesticide residue isomers viz., HCH and DDT in sprayers. α -HCH was detected in air sample analysis at Bakshi ka Talab, and Suspended Particulate Matter (SPM) and Respirable Suspended Particulate Matter (RSPM) levels slightly exceeds NAAQS limit at Bakshi ka Talab mango plantations.

Lower FVC was observed in sprayers which denote lung function abnormalities. Slowing of Motor Nerve Conduction Velocity (MNCV) was observed in sprayers during pre – spraying season at Bakshi ka Talab mango plantations. The air sampling in the identified locations shows presence of pesticide

residues. SPM and RSPM levels exceed National Ambient Air Quality Standards (NAAQS) value due to tilling of soil for agricultural purposes in the identified locations.

SPM and RSPM levels slightly exceeds NAAQS limit at Malihabad mango plantations and the drinking water shows no pesticide residues in Malihabad and Bakshi ka Talab. Proper Personal Protective measures (PPEs) viz., mask, gloves, goggles, and aprons etc. can reduce the health problems including the lung function abnormalities and abnormal haematological conditions observed among the study subjects.

Papers published/presented:

Papers actually published – 1 (one)

Papers presented at scientific meetings and conference – 6 (six)

Person to be contacted for further information if required

: Dr. M.K.J. Siddiqui
Director,
Council of Science & Technology, U.P.,
Lucknow

Title of Research Scheme / Project : Study of S – phase fraction and aneuploidy in patients with bone marrow suppression: Diagnostic and prognostic value

Name & Institution of the Principal Investigator : Dr. Ashutosh Kumar,
Prof., Deptt. of Pathology
K.G. Medical University,
Lucknow-226003, U.P., India

Contact No. : 0522-2343545 (office)
0522-2001846 (residence)

Duration : 03 years

Significant findings/Conclusions:

The object of the project was to study the diagnostic and prognostic value of S-phase fraction (SPF) and DNA aneuploidy in patients with bone marrow suppression. To differentiate Aplastic Anemia (AA) from Hypoplastic Myelodysplastic Syndrome (HMDS) in patients with bone marrow failure is a difficult and challenging task, as both the disorders have considerable clinical, cytological and histological similarities. The prognostic and therapeutic approaches to AA and HMDS are different and so it is imperative to differentiate them at the time of initial diagnosis. Studies reveal that a higher S-phase fraction (SPF) value and the presence of DNA aneuploidy in patients with AA even without the morphological evidence of dysplasia and presence of cytogenetic abnormalities may place these patients distinct from aplastic patients with lower SPF and without DNA aneuploidy. SPF and DNA aneuploidy may be important parameters in patients with aplastic anemia to predict the propensity to evolve into HMDS and acute myeloid leukemia and the presence of DNA aneuploidy in patients with aplastic anemia may be a novel tool for early detection of chromosomal abnormality. A serial measurement of SPF in patients with aplastic anemia may provide an early indication for development of dysplasia. The evidence of DNA aneuploidy in a substantial number of aplastic anemia patients may prompt the recognition of a distinct disease entity "bone marrow failure with clonal abnormality" rather than aplastic anemia itself. Bone marrow biopsy is thoroughly scrutinized for the evidence of dysplasia at the time of initial diagnosis and sensitive tests such as Florescence In Situ Hybridization (FISH) are used to detect cytogenetic abnormalities which would remain undetectable by conventional karyotyping.

Papers published/presented:

Papers actually published – 3 (three)

Papers presented at scientific meetings and conferences – 3 (three)

Person to be contacted for further information if required

: Dr. M.K.J. Siddiqui
Director,
Council of Science & Technology, U.P.,
Lucknow

Title of Research Scheme / Project : Co-infection of Hepatitis C Virus with Human Immunodeficiency Virus (HIV): Impact on Immunological Progression of HIV Disease

Name & Institution of the Principal Investigator : Dr. Vimala Venkatesh,
Associate Professor,
Department of Microbiology,
CSM Medical University,
Lucknow

Duration : 03 years

Significant findings/Conclusions:

The objective of the project is to study the proportion of HIV positive patients co-infected with HCV, to determine the base line immunological and clinical profile of HIV and HCV co-positive patients versus HIV positive alone patients and to follow up study of patients for determining clinical and immunological progression of HIV/HCV disease in north Indian patients. The study demonstrates that the HCV prevalence in HIV infected non drug using population is low which suggests that HCV is acquired independently of HIV, which is likely predominantly transmitted by heterosexual route in the study population. Risk factor evaluation highlighted the presence of multiple risk factors for HIV acquisition in large number of patients were unsterile injections was a common risk factor. A significant finding was that patients already initiated on Anti-retroviral therapy had fewer symptoms and baseline CD4+ data showed that higher CD4 counts had a negative co-relation to symptoms. These co-infections were acquired independently of HIV infection and the results of the study can be used in planning further studies to detect transmission within families. The study findings suggest that while testing for HCV/HBV is required for initiation of HIV HAART.

Papers published/presented:

Papers actually published – 4 (four)

Papers presented at scientific meetings and conferences – 4 (four)

Person to be contacted for further information if required : Dr. M.K.J. Siddiqui
Director,
Council of Science & Technology, U.P.,
Lucknow

Title of Research Scheme / Project : Study on the status of antioxidant enzymes and minerals in pregnant anemic women

Name & Institution of the Principal Investigator : Dr. A.A. Mahadi,
Professor & Head
Deptt. of Biochemistry,
C.S.M. Medical University,
Lucknow

Duration : 02 years

Significant findings/Conclusions:

The work done under the project indicates that in moderate non-anemic group of pregnant women less iron is utilized and excess of it leads to oxidative stress and the study suggest that in such cases oral iron supplementation may be given with suitable antioxidant according to the requirement to avoid unnecessary damage. The outcome of the project is useful in the management of anemia in pregnant women.

Person to be contacted for further information if required : Dr. M.K.J. Siddiqui
Director,
Council of Science & Technology, U.P.,
Lucknow

Title of Research Scheme / Project : Molecular Predictive Bioarkers of Hypoxia to find out the responsiveness to radio chemotherapy in advanced Head and Neck Cancer

Name & Institution of the Principal Investigator : Prof. M.L.B. Bhatt
Department of Radiotherapy,
Chhatrapati Shahuji Maharaj Medical University,
Lucknow

Email : drmlbhatt@yahoo.com

Duration : 03 years

Significant findings/Conclusions:

Head and neck cancer is most common malignancy world wide and it has long been considered that hypoxia is a major cause of failure of radio-chemotherapy. The purpose of the present study is to identify clinically useful biomarker to predict the outcome of therapy and evaluate clinical significance of Osteopontin (OPN) and Vascular Endothelial Growth Factor-A (VEGF-A) by the changes in serum level of these in squamous cell carcinoma under going chemo-radiation. The data suggests that VEGF-A and Osteopontin expression level is higher in comparison to healthy control. A correlation between the tumor response to therapy and these biomarkers in the head and neck malignancy will be established to compare the predictive value in predicting response to chemo-radiotherapy and find out the suitability for clinical use to predict the outcome of therapy (followup study under progress).

Papers published/presented:

Papers actually published – Nil

Papers presented at scientific meetings and conferences – Nil

Person to be contacted for further information if required

: Dr. M.K.J. Siddiqui
Director,
Council of Science & Technology, U.P.,
Lucknow

- Title of Research Scheme / Project** : Evaluation of immunomodulation by *Withania Somnifera* used as an adjunct DOTS-RNTCP to chemotherapy for increased effectiveness in pulmonary-tuberculosis patients
- Name & Institution of the Principal Investigator** : Prof. Rajendra Prasad
Deptt. of Pulmonary Medicine,
C.S.M. Medical University,
Lucknow
- Duration** : 02 years

Significant findings/Conclusions:

Cytokines play an important role in the patients of Tuberculosis (T.B.). This is the first study where in the case of T.B. patients TNF- α and Interferon- γ have been found at an increased level and after giving immunomodulator (*Withania Somnifera*), there has been seen a reduction in the levels of TNF- α and Interferon- γ . Study indicates that in case of pulmonary-tuberculosis category -1 patients, if *Withania Somnifera* is given along with the ATT treatment, it increases the immunity of the patients.

- Person to be contacted for further information if required** : Dr. M.K.J. Siddiqui
Director,
Council of Science & Technology, U.P.,
Lucknow

Title of Research Scheme / Project : Role of oxidative stress and antioxidants in pathogenesis of tuberculosis

Name & Institution of the Principal Investigator : Dr. Amita Jain
Professor,
Department of Microbiology,
K.G. Medical Univ., Lucknow

Duration : 02 years

Significant findings/Conclusions:

The main aim of the project was to study the effect of Catechin concentrate as antioxidant in case of pulmonary tuberculosis. It shows that catechin is a rich source of antioxidants and the present study shows that oxidative stress plays a definite role in pathogenesis of pulmonary tuberculosis and it was evidenced by the statistically significant change in anti oxidants and lipid peroxide levels in patients. The increase in oxidative stress shows the partial failure of the antioxidant defence mechanism of patients. Oral administration of the crude catechin extract in infected pulmonary tuberculosis patients results in the lowering down of oxidative stress. The study was planned to envisage to assess the free radical mediated destruction in terms of the antioxidant levels and the role of crude catechin extract, as an antioxidant, as adjuvant therapy.

Papers published/presented:

Papers actually published – 1 (One)

Papers presented at Scientific Meetings/Conferences – 2 (Two)

Person to be contacted for further information if required : Dr. M.K.J. Siddiqui
Director,
Council of Science & Technology, U.P.,
Lucknow

- Title of Research Scheme / Project** : To assess the determinants of *Pseudomonas aeruginosa* isolation from endotracheal aspirates in children on ventilation therapy
- Name & Institution of the Principal Investigator** : Prof. Shally Awasthi,
Dept of Pediatrics, C. S. M. Medical University,
Lucknow
- Duration** : 02 years

Significant findings/Conclusions:

Under this project, work has been done to assess the isolation rate of *Pseudomonas aeruginosa* in hospitalized pediatric patients on ventilation therapy. Endotracheal aspirate was taken as study sample from the studied subjects which included subjects from high dependency unit (HDU) and rest from pediatric intensive care unit (PICU). Examinations were performed to determine the factors associated with *Pseudomonas aeruginosa* and to determine the susceptibility rates and patterns in *Pseudomonas aeruginosa* strains isolated from pediatric ventilated patients. Antimicrobial susceptibility test of *Pseudomonas aeruginosa* strains were done by disc diffusion method and results were interpreted according to CLSI guidelines. Work done to analyze the pattern of carbapenam resistant *Pseudomonas aeruginosa* oprD gene from clinical isolates indicates high percentage of *Pseudomonas aeruginosa* endo-tracheal (ET) colonization among hospitalized patients on ventilation therapy and *Pseudomonas species* causes potentially lethal nosocomial infection in hospitals, especially in intensive care units. It was also found that subjects with long duration of ventilation had higher chances to develop colonization with *Pseudomonas aeruginosa*. More than half of *Pseudomonas aeruginosa* isolates were found in multi drug resistant (MDR). According to the definition of MDR *Pseudomonas species*, isolates must show intermediate sensitivity or resistance to at least three drugs in the following classes: β -lactams, carbapenems, amino glycosides, and fluoroquinolones. Resistance to various classes of antibiotics seen in *Pseudomonas aeruginosa* is considered to be associated with loss of the porin Opr D gene. Since the main mechanism of resistance of *Pseudomonas aeruginosa* is still unclear so preliminary molecular work was done with OprD gene and found point mutations in oprD gene in carbapenam resistant *Pseudomonas aeruginosa*. Findings of the work have re-emphasized the need to follow aseptic protocol in patients on ventilation to prevent nosocomially acquired endo – tracheal (ET) colonization with *Pseudomonas aeruginosa* and it is also recommended to perform hospital surveillance for development of antimicrobial resistance in *Pseudomonas aeruginosa* isolates.

Further molecular work focusing on OprD gene possibly may provide insight into mechanism of development drug resistant by *Pseudomonas aeruginosa* and there after lead to drug discovery.

- Person to be contacted for further information if required** : Dr. M.K.J. Siddiqui
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