

PROF. M. VISWANATHAN DIABETES RESEARCH CENTRE



WHO Collaborating Centre for Research, Education & Training in Diabetes

4, WEST MADA CHURCH STREET
ROYAPURAM • CHENNAI 600 013 • INDIA

ANNUAL REPORT 2009 – 2010

*"Every Person having diabetes should be helped to live
his normal span of life in a healthy way"*

Late Prof. M. Viswanathan



Prof. M. Viswanathan, M.D., FAMS
(26.8.1923 – 1.3.1996)

"Founder Director"

Diabetes Research Centre Foundation
Royapuram, Chennai 600 013.

*The Relentless
Crusader
Against Diabetes*



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Prof. M. Viswanathan Diabetes Research Centre



भारत सरकार
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By Registered Post

No. 14/7/88-TU-V

Date: 25 March 2010

The Director
Diabetes Research Centre Foundation
4, Main Road, Rayapuram,
Chennai - 600 013

*Recd
2/4/10*

Subject: Renewal of Recognition of Scientific and Industrial Research Organisations (SIROs).

Dear Sir,

This has reference to your application for renewal of recognition of Diabetes Research Centre Foundation, Chennai as a Scientific and Industrial Research Organisation (SIRO) by the Department of Scientific and Industrial Research under the Scheme on Recognition of Scientific and Industrial Research Organisations (SIROs) -1988.

2. This is to inform you that it has been decided to accord renewal of recognition to **Diabetes Research Centre Foundation, Chennai from 1.4.2010 up to 31.3.2013**. The recognition is subject to terms and conditions mentioned overleaf.
3. Receipt of this letter may kindly be acknowledged.

Yours faithfully,

(R. R. Abhyankar)
Scientist - G



**World Health
Organization**

Regional Office for South-East Asia

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In reply please
refer to: N3/72/1

Your reference:

Dr Vijay Viswanathan
Director
Diabetes Research Centre and M.V. Hospital
for Diabetes
No. 4, Main Road, Royapuram
Chennai - 600 013

12 November 2010

Dear Dr Viswanathan,

Subject: Redesignation of the Diabetes Research Centre and M.V. Hospital for Diabetes, Chennai, Tamil Nadu, as a WHO Collaborating Centre for Research, Education and Training in Diabetes. (WHO CC NO IND-85)

It gives me great pleasure to inform you that the Diabetes Research Centre and M.V. Hospital for Diabetes, Chennai, Tamil Nadu, as a WHO Collaborating Centre for Research, Education and Training in Diabetes has been approved for a period of four years, as from the date of this letter.

The terms of reference of the WHO Collaborating Centre would be:

1. To conduct epidemiological research on prevention and identification of predictors of diabetes and its complications
2. To strengthen education and training in diabetes research, prevention and management;
3. To evaluate the socio-economic impact of diabetes and its complications and contribute the data to the policy makers;
4. To develop methods for reducing diabetes risk factors at the community level

...Page 2

cc: The Secretary, Department of Health, Ministry of Health and Family Welfare, Government of India, Nirman Bhawan, New Delhi

cc: The Joint Secretary (IH Division), Ministry of Health and Family Welfare, Government of India, Nirman Bhawan, New Delhi

cc and through: The WHO Representative to India, Nirman Bhawan, New Delhi



Prof.M.Viswanathan Diabetes Research Centre



Dear Colleagues & Friends

It gives me great pleasure in writing this foreword for the 2009–2010 Report of the Prof. M. Viswanathan Diabetes Research Centre, the WHO Collaborating Centre for Research, Education and Training in Diabetes. Information about the scientific and research activities conducted by our Centre during the past two years has been compiled in this report.

Being a WHO collaborating centre, DRC has always been actively functioning towards achievement of the terms of reference given to the Centre by the WHO. In this context, various scientific projects and studies have been conducted by DRC and numerous articles have been published in peer-reviewed journals.

The Centre is also working hard to fulfill the mission statement of our Founder Director Prof. M. Viswanathan *"To make every person with diabetes lead his normal span of life in perfect health."*

I acknowledge the selfless and dedicated service of all our competent scientific staff for the help rendered to achieve these goals.

I am grateful to Dr. K. Satyavani & her team for preparing this Report.

Soliciting your encouragement & support,

With warm personal regards,

Dr. Vijay Viswanathan

Scientific & Research Staff

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Prof. S. N. Narasingan
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Dr. Vijay Viswanathan	<i>Member, Director</i>
Dr. J. Nagarathnam	<i>Medical Administrator, CEO</i>
Dr. K. Satyavani	<i>Member Secretary, Scientist</i>
Dr. Muthu Jayaraman	<i>Member, Nephrologist</i>
Justice Mr. G. Ramanujam	<i>Member, Former Judge</i>
Mr. A.S. Ranganathan	<i>Member, Legal Advisor</i>
Dr. T.P. Jacob	<i>Member, Vascular Surgeon/Philosopher</i>
Dr. M. Parthiban	<i>Member, HoD of Biochemistry</i>
Mrs. Geetha Padmanabhan	<i>Member, Journalist</i>

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Dr. Rajesh Kesavan, Podiatric Surgeon

Dr. Rohini Samuels, HoD, Dept. of Nutrition & Dietetics

Dr. K. Uma Mahesh, Diabetologist

Dr. Hemanga Barman, Diabetologist

Mrs. Sheela Paul, Dietician



Prof. M. Viswanathan Diabetes Research Centre National Research Grant for Diabetes

In January 1996, a Felicitation Committee consisting of leading Senior Citizens of Madras decided to felicitate Prof. M. Viswanathan in April 1996 as Prof. M. Viswanathan had completed 50 years as clinician and scientist in the field of Diabetology. As part of the felicitation it was decided by the committee to create an Endowment in Prof. Viswanathan's name for funding outstanding research in diabetes in India by an Indian Scientist. This decision was taken as no such research grant was available for diabetes research in our country and foreign research institutions are not prepared to fund research that will be exclusively carried out by an Indian in India without foreign collaboration and/or participation.

Prof. Viswanathan approved the idea and stated that the grant should be created to stimulate innovation in the field of diabetes research in India leading to practical advances in the prevention, detection and treatment or cure of diabetes. He also informed the committee that the ultimate fulfillment of the mission of Diabetes Research Centre and M. V. Hospital for Diabetes is research and that only research can lead to prevention or cure for diabetes or to ways to improve the lives of people affected by diabetes.

Unfortunately, this Endowment could not be created during his lifetime as Prof. Viswanathan passed away on 1st March 1996. The establishment of an Endowment entitled Prof. M. Viswanathan DRC National Research Endowment was announced by the management of the Diabetes Research Centre in September 1996.

The Scientific Committee selected Prof. Gunasekaran, Prof. of Physiology, and Ms. Daisy Mythili who was appointed as Prof. M. Viswanathan Research Fellow by the Christian Medical College, Vellore, for the award of this research grant for the years 1999–2000 & 2000–2001 for their project *"Electron microscopic studies on normal, cultured and transplanted, isolated monkey pancreatic islets."*

Dr. Manickam Krishnan, Lecturer and Asst. Research Officer, Genetics Research Cell, Sri Ramachandra Medical College and Research Institute, was awarded DRC National Research Grant for the year 2002 for his project *“A study on HNF-1 alpha mutations in maturity onset of diabetes of the young (MODY 3).”*

Dr. R. Suresh, Prof. & Head, Periodontics, Sri Ramachandra Dental College, Sri Ramachandra Medical College and Research Institute (DU), was awarded DRC National Research Grant for the years 2004–2006 for his project *“Type 2 diabetes mellitus and Periodontitis – two way phenomena?”*

Dr. Prabha Adhikari, Prof. of Medicine and Research Director, Kasturba Medical College Hospital Attavar, Mangalore, was awarded the DRC National Research Grant for the year 2010 for her project titled *“Prevalence of genetic polymorphism in (CYP) gene in patients with PCOS and their first degree relatives and its correlation with androgen excess, insulin resistance and cortisol excess”.*

Scientists and Researchers in this field interested in applying for this grant may write to the Director, Prof. M. Viswanathan Diabetes Research Centre for the necessary details.



Activities of the WHO Collaborating Centre for Research, Education & Training in Diabetes in India

WHO Collaborating Centre for Research, Education and Training in Diabetes was established on 1st August, 2002. Ever since the WHO Collaborating Centre was started, it has been closely associated with WHO, SEARO and Department of Chronic Diseases and Health Promotion of WHO, Geneva. It has been redesignated as a WHO Collaborating Centre for Research, Education and Training in Diabetes for a further period of four years w.e.f 12th November, 2010.

The terms of reference of the WHO Collaborating Centre are:

- t To conduct epidemiological research on prevention and identification of predictors of diabetes and its complications.
- t To strengthen education and training in diabetes research, prevention and management.
- t To evaluate the socio-economic impact of diabetes and its complications and contribute the data to the policy makers.
- t To develop methods for reducing diabetes risk factors at the community level.

The WHO Collaborating Centre has been actively involved in carrying out activities such as:

- t Organizing awareness raising programmes to high risk groups.
- t Conducting diabetes screening camps for the general population and for different occupational groups such as bank employees, police officers, railway employees, software professionals, Marvadi Trust association members, etc.
- t Conducting training programmes on "*Prevention on Diabetes*" and "*Management of Diabetes*" to doctors within India and from abroad.
- t Conducting diabetes training for the doctors and paramedical staff under WHO/IDF sponsorship from abroad and India of different duration ranging from one week to three months.
- t Sharing experiences with other WHO collaborating centres and SEARO, New Delhi.

- t WHOCC has taken up a major campaign on Primary Prevention of Diabetes with the Government of Tamil Nadu by training both rural and urban doctors. This is a structured training programme with basic and advanced level of training on the Primary Prevention of Diabetes. With the permission of the Director of Public Health, the training programme is being conducted for doctors in Primary Health Centres of Vellore and Villupuram districts.
- t A similar training programme is being conducted for doctors working in various Chennai Corporation Hospitals spread over entire metropolitan Chennai.



Doctors from Malaysia had undergone Intensive foot Care Training in the year 2010



India has a high prevalence of both diabetes and tuberculosis (TB), compared to any other country in the world. Severe hyperglycemia interferes with TB treatment thereby causing a delay in the effective management of the disease. Moreover, TB patients with diabetes are more likely to develop multi-drug resistance. Therefore, effective training to the doctors and health personnel on prevention, screening and proper management of diabetes among TB patients is necessary to challenge these dual diseases. In order to develop the skills of doctors and paramedics on this aspect, a project on *“Education and training in prevention of diabetes for tuberculosis health personnel”* was planned earlier by the DRC with funds from the World Diabetes Foundation (WDF).

The project was successfully launched during June 2009 by the Principal Health Secretary Mr. V.K. Subburaj, I.A.S. The main objective of this project is to train and educate TB health personnel and doctors, paramedics and health workers in prevention and control of diabetes among TB patients in selected areas such as Chennai, Tiruvallur and Kancheepuram, by conducting awareness camps and facilitating diabetes education for TB patients.

The project is expected to train the TB patients taking Directly Observed Treatment-Short Course (DOTS) treatment in Public Health Centre (PHC), District Tuberculosis Centre (DTC) and Corporation of Chennai Tuberculosis centres. Doctors, paramedics and health workers would also be trained in this aspect.

Till date, more than 100 awareness camps have been conducted and about 1783 TB patients have been educated and screened. More than 390 doctors, 150 paramedics and 175 health workers have been given training by the DRC-WDF staff.

Expected outcomes of the project would be to create an increased awareness about diabetes among the TB patients, health workers, paramedics, medical officers serving PHCs and DTCs; to identify subjects who have high risk for diabetes among TB patients; to prevent diabetes among TB patients; and to bring better control of diabetes among the TB patients.



Empowerment of laboratory technician (Nungambakkam, Chennai)



Field visit by WDF Team on 8th August 2010

Ms. Emillie (WDF) interacts with tuberculosis patients at Velliyur (Thiruvallur District). Dr. Ayoubh Khan (BMO), Lady M.O., Vellyur PHC, Dr. Rajeswari Rajan (Project Director) and Health Visitor are also seen in picture.

Epidemiology

1. Chennai Slim and Fit Programme

The increasing number of overweight children and those at risk of becoming overweight in urban regions of India has been documented by many studies conducted across India. The prevalence of childhood obesity was comparatively higher in schools with affluent children, as observed in previous DRC studies. Childhood obesity is a major public health issue that can lead to many health and social consequences, which can continue into later life. It is important to implement effective prevention programmes to control childhood obesity. The main objective of the Chennai Slim and Fit Programme is to prevent the development of cardiovascular diseases, diabetes and associated disorders among the younger generation in future.

The Programme has two components:

- *Awareness programme on childhood obesity (Mass approach)*

Awareness programme has been conducted in all the Central Board of Secondary Education (CBSE) schools of Chennai with the support of Regional Office of CBSE. As on date, 14 schools were covered in Chennai. The session involves PowerPoint presentation on obesity, its implications on health, causes of obesity and about the benefits of healthy food choices as well as performing regular physical activity. It is followed by a discussion session for 15 minutes in which the children could interact with a medical officer and dietician. A structured pre-tested questionnaire was administered among randomly selected children in each school to assess the awareness level on childhood obesity before and after attending the programme.

- *Structured and intensive motivation programme for weight management (High risk approach)*

Structured motivation sessions will be done periodically for maintaining healthy lifestyle among overweight and obese children, and the impact of such a programme would create benefits in the long run through behavior modification. This study will assess the positive changes in diet

habits, physical activity and the changes in BMI as a result of a periodic motivation session among the overweight and obese children. An individualised diet and physical activity plan will be advised to each child at risk for 12 schools in Chennai and they will be motivated and followed up at regular intervals for 1 year.

2. Diabetes Amputation Prevention Initiative in the Community (DAPIC)

DAPIC was planned as a comprehensive and cost effective amputation prevention programme. This project is to highlight the importance and success of patient education. The main aim of the study is to prevent diabetes-related amputation in the rural population. Our project site is Thiruvallur District. Two blocks, each with ten villages, have been selected. A door-to-door survey has been conducted in all the selected villages and the diabetic subjects at high risk of developing foot complications will be recruited. A trained self-help group will educate them about proper foot care and the importance of foot wear. As a result, a cost effective model will be developed to prevent diabetic amputations among the rural population.

3. Urban slum screening programme for diabetes

Rural unemployment, migration towards the cities seeking jobs, lack of education and high cost of living have been attributed to be the causes of poverty among the urban population. As a result, the urban poor people have many disadvantages such as inadequate and unhealthy living environment, lack of sufficient income and limited access to healthcare services. In addition to the incidence of certain communicable diseases, non-communicable diseases such as obesity, hypertension and diabetes are also on rise among this population. This may be attributed to the changes in physical activity and dietary habits even among the poorer sections of the society. A community screening programme and awareness session on primary prevention of diabetes was conducted in four slum areas of North Chennai during 2010 – 2011.

4. Cost of diabetes and its complications – A multi-centric study

Diabetes like any other chronic disease requires lifetime management and regular monitoring. Several studies done in various other countries showed that diabetes care was accounting for 2.5 to 15% of total health care. The estimated global expenditure for diabetes for the year 2030 will be around



561 International Dollars. A study conducted by DRC in 2009 estimated individual annual direct and indirect cost for diabetes care was 25,391 INR and 4,970 INR, respectively. With the epidemic of diabetes in developing countries and the scarcity of data on the economic impact due to diabetes, a multi-centric study has been planned and conducted to assess the socioeconomic impact of diabetes in three countries, viz. India, Bangladesh and Pakistan.

Genetics

1. Heat-shock protein gene polymorphisms and the risk of Diabetic nephropathy

Aim: To determine the association between Heat shock Protein-70 gene polymorphism among type 2 diabetic subjects having nephropathy.

HSPs (heat-shock proteins) are molecular chaperones synthesized under stress conditions and are involved in renal cell survival and matrix remodelling in acute and chronic renal diseases. They are important in physiological and pathological processes and are highly active within the immune system. This prospective study is undertaken to examine the hypothesis that HSP-70 gene polymorphisms affect susceptibility to diabetic nephropathy in South Indian patients with Type 2 diabetes mellitus. Hence a total of 152 type 2 diabetic subjects with different degrees of renal impairment are recruited to assess the HSP-70 polymorphism. Gene polymorphism will be determined by PCR-based RFLP technique.

2. SDF1 α gene polymorphism in different grades of diabetic foot ulcer patients

Aim: To study the SDF-1 α polymorphism among type 2 diabetic subjects having different grades of foot ulceration.

Diabetic foot ulcer is a major health problem, which affects 15% of the 200 million patients with diabetes worldwide. Wound healing occurs as a cellular response to injury and involves activation of keratinocytes, fibroblasts, endothelial cells, macrophages and platelets. Many growth factors and cytokines released by these cell types are needed to coordinate and maintain healing. Diminished peripheral blood flow and decreased local neovascularization are critical factors

that contribute to delayed or non-healing wounds in these patients. Stromal-derived factor-1 α (SDF1 α) is a cytokine that regulates the trafficking of various cell types and plays a pivotal role in cell migration, proliferation and survival. Hence, the purpose of this study is to assess whether SDF-1 α polymorphism is associated with different grades of South Indian diabetic foot ulcer patients.

3. Does Pro12Ala Polymorphism in the PPARG gene contribute to the development of diabetic nephropathy among South Indian type 2 diabetic patients?

Aim: To explore whether the Pro12Ala polymorphism is associated with diabetic nephropathy in a South Indian population of type 2 diabetic patients.

Study design: Cross-sectional study in an ethnically homogeneous population that involved the vast majority of people with type 2 diabetes in a geographically defined area.

The peroxisome proliferator-activated receptors (PPARs) are ligand-dependent transcription factors that are members of the nuclear receptor superfamily. At least three different PPAR subtypes (a, b and c) have been described. PPAR- δ is highly expressed in adipocytes and is responsible for the regulation of adipocyte differentiation and glucose homeostasis, but it has also been suggested to act as a regulator of cell proliferation and inflammatory response. PPAR- γ gene has been viewed as a “thrifty gene”, with an important role in the development of type 2 diabetes and diabetes-related traits. Hence, a total of 205 type 2 diabetic subjects having diabetic nephropathy are recruited to study the association of Pro12Ala gene polymorphism among South Indian population.

4. To find the association of SNPs in lipoic acid synthase gene in diabetic subjects

The prevalence of diabetes mellitus is increasing worldwide at an alarming rate due to population growth, obesity, sedentary life style, aging and oxidative stress. In the past few decades, researchers observed that among all other factors, oxidative stress is another deleterious factor leading to type 2 diabetes by inducing insulin resistance. Lipoic acid (LA) is a versatile antioxidant that decreases



oxidative stress and restores reduced levels of other antioxidants in vivo (an essential cofactor in oxidative metabolism in the mitochondria). Endogenous LA is synthesized from octanoic acid by the action of lipoic acid synthase. The aim of this study is to determine the association of polymorphism in lipoic acid synthase in newly diagnosed diabetic and prediabetic patients.

Prevention

1. Prospective study on subjects with Early Glucose Intolerance (EGI)

EGI is considered as a prediabetic condition. Subjects with elevated 1 hour value (intermediate post glucose level >160 mg/dl) during OGTT termed as the early glucose intolerance (EGI) were recruited in this study. This analysis was planned to compare the risk factors associated with the development of diabetes among the EGI subjects based on the follow-up visits (intervals).

Baseline anthropometric measurements are taken and biochemical details like GTT, lipid profile and HbA1c will be recorded. Details like type of exercise and duration are also recorded. Plasma, whole blood and serum samples are collected and stored for identification of genetic markers. During follow-up visits, assessment of diet and physical activity will be done. Biochemical details and anthropometric details are recorded.

Finally, at the end of the study the subjects will be divided into three groups based on their follow-up visits to the Centre, Group 1 regular (regular follow-up), Group 2 yearly once (yearly once follow-up) and Group 3 irregular (follow-up visit after one year or more). Conversion rates and risk factors will be identified in the study groups.

2. Gestational Diabetes Mellitus

Gestational diabetes mellitus (GDM) is diagnosed first time during pregnancy. GDM usually occurs in the last half of pregnancy, when the fetus is growing larger. GDM increases the risk of miscarriage or neonatal complications to the baby.

In this study, subjects with abnormal GTT (during pregnancy) values at fasting, 1 hour and 2 hour were registered and followed up periodically.

Anthropometric measurements are taken; biochemical details are recorded and clinical details like gravida (total number of pregnancies), para (number of living children), last menses period (LMP) and expected date of delivery (EDD) will be collected. Plasma, whole blood and serum samples are collected and stored for analysis.

At the end of the pregnancy, postpartum details such as type of delivery, sex of baby, baby outcome and biochemical details are recorded. GDM recurs approximately in 50% of subsequent pregnancies. This high risk group of subjects requires regular follow-up. Yearly once follow-up is being done to check the glucose tolerance status among this group of subjects. The outcome of the study will be assessed by comparing the baseline and the follow-up details. Risk factors associated with the development of diabetes among them will be assessed.

Complications

1. A comparative study between the effects of iontophoresis with that of galvanic stimulation in improving vasomotor functions in patients with diabetic neuropathy

Aim: To determine and compare the efficacy of iontophoresis and galvanic stimulation in improving vasomotor function in patients with diabetic neuropathy.

Study design: Diabetic patients with neuropathy, good intellectual and comprehensive skills will be recruited in this study. Iontophoresis will be administered using acetyl choline and sodium nitroprusside drugs, followed by appropriate current voltage and ankle and foot exercises. Galvanic stimulation will be given using the appropriate current voltage, followed by ankle and foot exercises.

The study subjects will be assessed later to compare the efficacy of iontophoresis and galvanic stimulation in improving vascular function.

2. Effects of intensive education with audio-visual aids in improving psychosocial status in patients with diabetic neuropathy

Proper education programmes on foot care practices have shown beneficial effects in preventing and reducing neuropathy and rate of re-ulceration



in diabetic patients with foot complications. Such programmes could also have a positive influence on the psychological status of the patients. Hence, this study has been devised to assess the effects of intensive education with audio-visual aids in improving psycho-social status in patients with diabetic neuropathy.

3. Efficacy of intrinsic foot muscle exercises in preventing claw toes and foot complications in early diagnosed neuropathic and long-term non-neuropathic type 2 diabetes patients

This study is designed to find out the efficacy of intrinsic foot muscle exercises in preventing claw toes and foot complications in early diagnosed neuropathic and long-term non-neuropathic type 2 diabetes patients. Diabetic patients with early neuropathy will be recruited in this study. The study subjects will be made to perform intrinsic foot muscle exercises, along with proper diabetic footwear and foot care practices and they will be followed up for further assessment.

4. Risk factors for recurrence of ulcer following first ray amputation in diabetic patients

Recurrence of foot ulcers in diabetic patients occurs frequently and many risk factors have been identified as causes, such as foot muscle weakness, improper footwear, plantar fasciitis, improper glycemic control, and barefoot walking. This study has been designed to identify the most common predominant risk factor for re-ulceration in diabetic patients who had undergone digital amputation.

5. Effectiveness of kinematic chain exercises in diabetic patients with neuropathic foot

Aim: This study is planned to find the efficacy of kinematic chain exercises in reducing neuropathic pain in diabetic patients. Diabetic patients with the presence of neuropathy in their foot will be examined and they will be made to perform kinematic chain exercises at regular intervals depending on the severity of their neuropathy. Assessment of pain in the patients will be done to find out the efficacy of the kinematic chain exercises.

6. Efficacy of rocker bottom footwear in preventing ulcers in the forefoot of diabetic patients with neuropathy and deformed toes

People with diabetes and foot complications need therapeutic footwear to maintain pressure imbalance, neuropathy and deformities. Therapeutic footwear helps in reducing the rate of re-ulceration in the diabetic patients. The main aim of this study is to assess the efficacy of rocker bottom footwear in preventing ulcers in deformed toes of diabetic patients with neuropathy. The study subjects will be advised foot exercises, stretching, and therapeutic footwear, i.e., rocker bottom footwear, and the efficacy of rocker bottom footwear will be assessed and compared with that by foot exercises.



Research Collaborators

<p>I. Diabetic Kidney Disease</p>	<p>Prof. Giancarlo Viberti, M.D., FRCP Professor of Diabetes and Metabolic Medicine Dept. of Diabetes and Endocrinology, Guy's Campus King's College, London.</p> <p>Dr. Kumar Sharma, M.D., F.A.H.A. Professor of Medicine & Director, Translational Research in Kidney Disease, University of California at San Diego/VA Medical System, La Jolla, CA, USA.</p> <p>Dr. B. S. Kasinath, M.D., Professor of Medicine, Division of Nephrology University of Texas Health Science Center Floyd Curl Drive, San Antonio, TX, USA.</p>
<p>II. School Children Studies</p>	<p>Dr. Goutham Rao, M.D., Clinical Director, Weight Management and Wellness Centre, Children's Hospital of Pittsburgh, Pittsburgh, USA.</p>
<p>III. Diabetic Foot</p>	<p>Dr. Jayesh Shah, M.D. Dr. Bhavesh Shah, M.D. South Western General Hospital San Antonio, TX, USA.</p> <p>Mr. Gautham Gopalakrishna Senior Asst. Director, CLRI, Chennai.</p> <p>Mr. B.N. Das Deputy Director, CLRI, Chennai.</p> <p>Mr. Md. Sadiq Senior Asst. Director Shoe Design and Development Centre, CLRI Adyar, Chennai.</p> <p>Dr. David Campbell Vascular Surgeon, Beth Israel Deaconnes Foot Centre & Associate Clinical Prof. of Surgery, Harvard Medical School, USA.</p>



	<p>Dr. Thomas Lyons Podiatrist & Clinical Instructor Harvard Medical School, USA.</p> <p>Dr. Z.G. Abbas Consultant Physician, Daresalam, Tanzania.</p>
IV. Wound Healing	<p>Dr. Mary Babu Retd. Scientist, Head – Bio Materials Division CLRI, Chennai.</p> <p>Dr. Raj Mani, D.Sc., FACA, FIPEM, C CSci. Consultant in Clinical Sciences & Senior Lecturer (Editor-in-Chief, International Journal of Lower Extremity Wounds) Southampton University Hospitals Trust Southampton, United Kingdom.</p>
V. DRC – WDF Project	<p>Tuberculosis Research Centre (WHO Collaborating Centre for Tuberculosis Research & Training) Chetpet, Chennai.</p> <p>Resource Group for Education and Advocacy for Community Health (REACH) Mount Road, Chennai.</p>
VI. Foot care training programme (SEARO-WHO)	<p>Dr. J.S. Thakur, MD, DNB, FIPHA Cluster Focal Point National Professional Officer, Non-Communicable Diseases and Social Determinants of Health WHO Country Office for India (South-East Asia Regional Office) Nirman Bhawan, New Delhi.</p>



1. Footwear for Diabetic Patients with Different Risk Foot Categories

Foot-related problems present a major challenge to professionals involved in diabetes care. Approximately 40-72 % of all lower extremity amputations are related to diabetes. Most ulcers occur at the toes due to poorly fitting footwear. Proper footwear is one of the most important aspects of preventive foot care. New types of foot wear are now being prepared at M.V. Hospital, Royapuram, with technical assistance from Central Leather Research Institute (CLRI), Chennai, for diabetic patients with foot complication.

Patients in risk category 0, 1 (low risk) are provided comfortable footwear made of good insole materials. These patterns are more attractive and acceptable to the patients than the conventional MCR footwear. Patients in risk category 2,3 (high risk) and those with previous ulceration and foot deformities are given custom made footwear with moulded insole.

Prof M.V. DRC and CLRI have an ongoing collaboration on footwear research and different types of footwear are being developed for patients with diabetes. This collaboration has resulted in the development of footwear which is inexpensive compared to the therapeutic footwear available in Europe and USA.

Recently, a special footwear called the "DIASTEPP" developed by both Prof M.V. DRC and CLRI has been patented with a registered trademark.

2. Research and Wound Healing in Diabetes

An active collaboration is going on between the foot clinic at Prof M.V. DRC and CLRI in the field of wound healing. Different types of wound dressings and growth factors for wound healing are being studied in diabetic foot ulcers. These studies are being carried out under the guidance of Dr. Mary Babu, Former Deputy Director, Head of Biomaterials Division, CLRI, Chennai.

Participation in Seminars and Conferences

Dr. Vijay Viswanathan - 2009

Date	Meeting/Conference	City/Country
27–28 th February 2009	Research Society for the Study of Diabetes in India (RSSDI) Mahacon 2009 – Talk on <i>“Optimizing antimicrobial therapy for diabetic foot infections”</i>	Ahmedabad
6–9 th March 2009	3 rd Wound Care Conference – delivered a lecture on <i>“Breaking the Vicious Cycle of Diabetic Foot Ulcers-Patient Education”</i>	St. Luke’s Hospital, Malaysia
19–21 st March 2009	Global Diabetic Foot Conference (DFCON 2009) – delivered a lecture on <i>“World Class Care for the Most Neglected? The Chennai Experience”</i>	Los Angeles, USA
5 th April 2009	Diabetes Bonanza 2009, organised by IMA, Tuticorin branch – Talk on <i>“Successful strategies for implementation Insulin yesterday, today and tomorrow”</i>	Tuticorin
18–19 th April 2009	Delhi Diabetic Forum , 17 th Annual Conference on Diabetes – Talk on <i>“Economics of diabetes care in India”</i>	New Delhi
26 th April 2009	MVD DIACON 2009 – Talk on <i>“Managing diabetes with latest pharmacological agents: do’s and don’t’s”</i>	Madurai
9–10 th May 2009	TAPICON 2009 Scientific programme – Talk on <i>“Prevention of diabetes: pharmacotherapy is the right choice”</i>	Kanyakumari
23–24 th May 2009	Amrita Diabetic Foot Conference – delivered a lecture on <i>“Diabetic foot management and its complications”</i>	Cochin
28–30 th May 2009	European Diabetic Nephropathy Study Group, 22 nd Annual General Meeting	Rome, Italy



Date	Meeting/Conference	City/Country
15–19 th June 2009	SEANET NCD meeting organised by WHO – Talk on <i>“Strengthening Partnerships for Integrated Prevention and Control of Non-communicable diseases”</i>	Chandigarh
28 th August 2009	4 th Annual Conference of Indian Society of Cardiology – Talk on <i>“Diabetes and heart failure”</i>	Chennai
26–27 th September 2009	5 th Pain Summit – Talk on <i>“Burden of neuropathic pain”</i>	Shanghai, China
20–24 th October 2009	20 th World Diabetes Congress organised by the International Diabetes Federation	Montreal, Canada
6–7 th November 2009	Expert Meeting of the International Union Against Tuberculosis and Lung Diseases	Paris, France
15–17 th December 2009	WHO Forum and Technical Meeting on population-based prevention strategies for childhood obesity – Talk on <i>“National Strategies on population based prevention of Childhood Obesity”</i>	Geneva, Switzerland

2010

Date	Meeting/Conference	City/Country
31 st January 2010	9 th International Symposium on Diabetes – delivered a lecture on <i>“New Management strategies in Diabetic Foot”</i>	Mumbai
3–4 th April 2010	TAPICON 2010	Chennai
17–18 th April 2010	18 th Annual Conference on Diabetes of Delhi Diabetic Forum, DIABCON 2010 – Talk on <i>“Re-thinking the diagnosis of Type 2 Diabetes. Is HbA1c the final answer?”</i>	New Delhi
24 th April 2010	MVD DIACON 2010 – delivered a lecture on <i>“Safety of agents used in the management of diabetes”</i>	Chennai



Date	Meeting/Conference	City/Country
15 th May 2010	Asia Advisory Panel Discussion Forum: Advancing Diabetes Management in Asia – Talk on <i>“Developing integrated diabetes care and good diabetes practices in India”</i>	Beijing, China
26 th May 2010	1 st Health Fare at US Consulate – Talk on <i>“Burden of Diabetes Care in India”</i>	Chennai
18 th June 10	Advanced Cardiovascular Therapeutics (ACT) 2010 – delivered a lecture on <i>“Optimal Glycemic Control for Cardiovascular Protection in Diabetics”</i>	Chennai
23 rd July 2010	American College of Cardiology International Distance Education Program 2010 – Talk on <i>“Insulin Resistance: Its Implication and Management”</i>	Beijing, China
7–8 th August 2010	New Frontiers in Diabetes – Talk on <i>“Diabetic Nephropathy and Kidney Failure in Diabetes: Are genes completely responsible?”</i>	Belgaum, Karnataka
13–14 th August 2010	New Frontiers in Diabetes Research meeting	Sri Sathya Sai University, Puttaparthi, AP
27 th August 2010	Scientific meeting on Diabetes at Vikram Sarabhai Space Centre	Trivandrum
4–5 th September 2010	Regional Diabetes India Update – Talk on <i>“Critical Care of Diabetic Foot: The Indian Relevance”</i>	Government Medical College, Jammu
2 nd October 2010	9 th DFSICON 2010 – delivered a lecture on <i>“Micro Angiopathy - essentials and clinical implications”</i>	Bangalore
20–21 st October 2010	WHO 3 rd NCD Research meeting on <i>“Development of a Prioritized Research Agenda for Prevention and Control of Non-Communicable Diseases”</i>	Geneva, Switzerland
23–24 th October 2010	Andhra Pradesh Diabetes Federation – Talk on <i>“Prevention of Diabetic Nephropathy: What is new?”</i>	Hyderabad, AP

Date	Meeting/Conference	City/Country
10 th November 2010	Glasgow Caledonian University – delivered a lecture on <i>“Diabetes in India: Problems and Solutions”</i>	Glasgow, UK
18–19 th November 2010	RSSDI 2010- delivered a lecture on <i>“Epidemiological perspectives of Diabetic Foot Complications in India”</i>	Cochin
25–26 th November 2010	WHO Meeting – Talk on <i>“Expert consultation on diagnosis and management of diabetes in primary care in low-resource settings”</i>	Geneva, Switzerland

Dr. K. Satyavani

Date	Meeting/Conference	City/Country
5–8 th November 2009	Oral presentation on <i>“Levels of urinary monocyte chemoattractant protein-1 (uMCP-1) at different stages of diabetic nephropathy in type 2 diabetic subjects in India”</i> and presented a poster on <i>“Efficacy of glycated albumin (GA) in comparison with glycated haemoglobin (HbA1c) in type 2 diabetic subjects in India”</i> in the 37 th Annual Scientific Meeting of the Research Society for the Study of Diabetes in India (RSSDI)	Ahmedabad, Gujarat
18–19 th November 2010	Three oral presentations on <i>“The costs of treating long-term diabetic complications in a developing country”</i> and <i>“Effect of yogasanas on glycemic, haemodynamic and lipid profile in newly diagnosed type 2 diabetic patients”</i> and <i>“Prevalence of non-communicable disease and associated risk factors in a specific North Indian population settled in Chennai in comparison with South Indian population”</i> and presented a poster on <i>“Visceral adiposity index and pattern of dyslipidemia at different stages of glucose tolerance”</i> in the 38 th Annual Scientific Meeting of the RSSDI	Cochin, Kerala

Dr. M. Parthiban

Date	Meeting/Conference	City/Country
5–8 th November 2009	Oral presentation on <i>“Is Toll like receptor 4 (TLR4) gene Asp299Gly single nucleotide polymorphism (SNP) associated with South Indian type 2 diabetes?”</i> in the 37 th Annual Scientific Meeting of the RSSDI	Ahmedabad, Gujarat
19–20 th December 2009	Delivered a lecture on <i>“Incretins and Diabetes”</i> at the National Conference on Diabetes Mellitus and Cancer – Dia-Can 2009	Annamalai University, Chidambaram
18–19 th November 2010	Two oral presentations on <i>“High prevalence of insulin resistance among overweight children with a predilection towards female gender: increased risk for future type 2 diabetes and cardiovascular disease: Chennai Slim & Fit Program”</i> and <i>“No association of snp in +838c/g metallothionine (mt) 2a gene with type 2 DM population of South India”</i> in the 38 th Annual Scientific Meeting of the RSSDI	Cochin, Kerala



Research Staff

Mr. K. Thanigaivelan K, Research Scholar, presented a paper on *“Association of Pro12Ala single nucleotide polymorphism (SNP) of the PPARG gene with T2DM among South Indian population”* at the 37th Annual Scientific Meeting of the Research Society for the Study of Diabetes in India (RSSDI), during 5–8th November 2009, at Ahmedabad, Gujarat.

Ms. Priyanka Tilak, Research Scholar, received the **“Best Poster Award”** for her poster on *“Association of monocyte chemoattractant protein-1 gene polymorphism at different stages of diabetic nephropathy among type 2 diabetic subjects in India”* at the 37th Annual Scientific Meeting of the RSSDI, during 5–8th November 2009.

Ms. Ezhilarasi made a poster presentation on *“A1166C single nucleotide polymorphism (snp) of the angiotensin II type 1 receptor among south Indian T2 DM population”* at the 37th Annual Scientific Meeting of the RSSDI, during 5–8th November 2009.

Ms. Meerza Rafi made a poster presentation on *“Association of dyslipidemia and having high albuminuria with coronary artery disease among type 2 diabetes”* at the 37th Annual Scientific Meeting of the RSSDI, held during 5–8th November 2009.

Mr. K. Thanigaivelan, Research Scholar, made a paper presentation on *“Association of TCF7L2 gene variant C/T rs7903146 with T2DM among South Indian population”* and received prize for the **“Best Oral Presentation”** at the National Conference on Diabetes Mellitus and Cancer, Dia-Can 2009 held at Annamalai University, Chidambaram, during 19–20th December 2009.

Ms. Sheela Paul, Senior Dietician, made an oral presentation on *“Effect of isocaloric complex carbohydrate mixed meals on blood glucose response”* at the 38th Annual Scientific Meeting of the RSSDI, 18–19th November 2010 at Cochin, Kerala.

Ms. Evangeline Stafford presented a paper on *“Insilico approach of designing a glucokinase activator as a treatment option of*

MODY” at the 38th Annual Scientific Meeting of the RSSDI, held during 18–19th November 2010.

Dr. M. Deepa made a poster presentation on *“Analysis of the influence of bacterial flora on the mode of intervention of the diabetic foot ulcer in patients attending tertiary diabetes care centre in South India”* at the 38th Annual Scientific Meeting of the RSSDI, 18–19th November 2010.

Dr. Sripriya Shaji presented a poster on *“Fear about marriage and conception among youth with type 1 diabetes”* at the 38th Annual Scientific Meeting of the RSSDI, during 18–19th November 2010.

Ms. Ramya Ganapathy, Ms Anu Jiji and Mr. B. Elayaraja presented posters at the 38th Annual Scientific Meeting of the RSSDI, during 18–19th November 2010.

Mr. U. Dhamodharan got a prize for **“Best Poster Presentation”** on *“No association of SER1369ALA single nucleotide polymorphism in ABCC8 gene among South Indian type 2 DM population”* at the 38th Annual Scientific Meeting of the RSSDI, held between 18th and 19th November 2010.

Ms. Ezhilarasi presented a poster on *“Association of C825T single nucleotide polymorphism of GNB3 gene with type 2 diabetic in South Indian population”* at the 38th Annual Scientific Meeting of the RSSDI, held between 18th and 19th November 2010.



Meetings/Conferences organised by Prof. M.V. DRC (2009–2010)

2009		
Date	Programme	Place
3–4 th January 2009	3 rd Winter Indo-American CME Programme in association with API-TNSC, ATMA and MCI	Chennai
15 th February 2009	Prof. M. Viswanathan Gold Medal Oration & DRC Gold Medal Oration 2008 awards	Chennai
12 th September 2009	Socio economic Impact of Diabetes and its complications	Chennai
2 nd November 2009	Launch of DIASTEP – talk on <i>“Importance of footwear in preventing diabetic foot complications”</i> by Dr. Vijay Viswanathan	Chennai
12–13 th December 2009	1 st Multinational Study Group on Diabetic Foot and Wound Healing – Dr. Vijay Viswanathan’s talk on <i>“Prevention of diabetic amputations by bringing together expertise from both the developed and developing countries”</i>	Chennai
2010		
14 th March 2010	Prof. M. Viswanathan Gold Medal Oration & DRC Gold Medal Oration 2009 awards	Chennai
30 th September 2010	IMPRESSION 2010 (A Programme on lifestyle and Diabetes) (To create awareness about tobacco and alcohol)	Chennai
9–10 th October 2010	Diabetes Expo	Bangalore
29–30 th October 2010	Meeting on <i>“Diabetic Foot Management”</i> in association with Glasgow Caledonian University	Chennai

After undergoing a two-year Postgraduate Residential Training Programme in Diabetology and having passed the Fellowship Examination through M.V. Institute of PG studies in Diabetology, the following doctors have been awarded the Fellowship of Diabetes Research Centre (FDRC) during the period 2009–2010.

2009

Dr. Abani Kumar Patro,
Ganjam, Orissa

Dr. Srikanth Medimpudi,
*Krishna District, Andhra Pradesh –
Best outgoing trainee doctor, Awarded
Prof. M. Viswanathan Gold Medal*

Dr. Ranjit Kumar Khatua,
Bhadrak, Orissa

Dr. P.R. Ganesan,
Thuraiyur, Tamil Nadu

Dr. Markhi A. Karmur,
Jamnagar, Gujarat

Dr. Apurva Ranjan Jena,
Bhadrak, Orissa

2010

Dr. Sunaina Siddappa,
Mandya District, Karnataka

Dr. Mahalakshmi,
*Namakkal, Tamil Nadu – Best outgoing
Trainee Doctor, Awarded
Prof. M. Viswanathan Gold Medal*

Dr. Nitin Subrav Gade,
Sholapur, Maharashtra

Dr. Yasa Hanumantha Rao,
Vijayawada, Andhra Pradesh



Fellowship Certification in Diabetology jointly conducted by Indian Medical Association (Tamil Nadu State Branch) & M.V. Hospital for Diabetes

An alarming increase is seen in the prevalence of type 2 diabetes in India. There is a need to provide professional care to the patients to treat the complications and to help in the prevention of the non communicable diseases in high risk group. This goal could be achieved by conducting training programmes to the physicians treating the diabetic patients.

The WHO Collaborating Centre in Collaboration with Tamil Nadu state chapter of IMA had launched a one-year distance education programme (Fellowship Certification in Diabetes) for general practitioners during February 2008. This is an ongoing programme, and currently about 650 doctors have completed the course.

The curriculum includes management of diabetes and its complications. The curriculum consists of contact classes and one week of hands-on experience to give practical exposure and train the doctors to manage diabetes and its complications effectively. Preference will be given to the candidates from the rural areas of India.



Certificate Course in Diabetology jointly conducted by M.V. Hospital for Diabetes and Prof. M. Viswanathan Diabetes Research Centre and Hansa MedCell

Another Certificate Course in Diabetology has been started by the Diabetes Research Centre in collaboration with Hansa MedCell during June 2010. The main objective of this course is to improve the knowledge of the clinicians and diabetologists all over India to manage the diabetic patients in a better manner.

The duration of the course is one year. The curriculum consists of 12 modules, video presentations and case vignettes regarding various aspects of diabetes. Each of these materials is delivered every month to the registered candidates. Evaluation of the candidates involves three online examinations and one theory examination and they must also submit a case report for the completion of the course.

So far, 900 graduate and postgraduate doctors from all over the country have registered for the course.



Other Programmes offered by Prof. M. Viswanathan Diabetes Research Centre in affiliation with The Tamilnadu Dr. M.G.R. Medical University

Besides the above two certificate courses in Diabetology, the Prof. M. Viswanathan DRC also offers few fellowship and academic programmes that have got affiliation by The Tamilnadu Dr. M.G.R. Medical University.

- *Fellowship programmes*
 - a One-year Fellowship Programme in Diabetes: Candidates with MD in General Medicine are eligible to apply for this programme.
 - a One-year Fellowship Programme in Podiatry: Candidates who have obtained their MS in General Surgery are eligible for this programme.
- *Postgraduate Diploma in Clinical Diabetology*
 - a This is a two-year programme in Clinical Diabetology. Candidates with an MBBS degree are eligible to apply for this course.
- *Allied Health Science Courses*
 - a Post graduate Diploma in Diabetes Education
 - This is a one-year programme focusing on diabetes education. Candidates who have passed B.Sc. in Nutrition / Food Service Management and Dietitics / Clinical Nutrition & Dietitics / Food and Nutrition / Nursing / Microbiology / Biochemistry / Botany / Zoology are eligible to apply for this course.
 - a Diploma in Podiatry
 - The duration of this programme is 2 years and the minimum educational qualification eligible for this programme is standard 10th/SSLC pass from a recognized Board of school education.
 - a B.Sc., Medical Laboratory Technology
 - This is a three-year programme on medical laboratory technology. Candidates who have passed the standard XII examination conducted by the Tamilnadu State Higher Secondary Examination Board with Science subjects viz., physics, chemistry, botany & zoology or physics, chemistry, biology & mathematics or equivalent subjects in the Central Board of Secondary Examination or any other Board recognized by The Tamilnadu Dr. M.G.R. Medical University are eligible to apply for this course.

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Abstract

Levels of glycated albumin at different stages of diabetic nephropathy in India

Vijay Viswanathan, Satyavani Kumpatla, Priyanka Tilak, Parthiban Muthukumar

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Aims: Glycated haemoglobin (HbA1c) which is an index of long term glycaemic control in diabetic patients is measured in majority of patients worldwide. Glycated albumin (GA) is useful for the evaluation of short term glycaemic control (2 weeks) in patients with diabetes. The aim of this study was to assess the GA levels at different stages of diabetic nephropathy in Indian population.

Materials and Methods: A total of 147 subjects (M:F; 95:52) were selected for this study and were divided into three groups based on their renal function and compared with a non diabetic control group (n=50, M:F; 14:36). The groups were as follows; group 1 (control) n=50, group 2 (normoalbuminuria) n=42, group 3 (microalbuminuria) n=55, group 4 (proteinuria) n=50. GA was measured by enzymatic procedure using the Lucica GA – L kit (Asahi Kasei Pharma Corp, Japan).

Results: The normal cutoff value for GA was derived using control group and it was found to be 15% (range 7-17%). GA was significantly higher in diabetic patients at different stages of diabetic nephropathy compared to non diabetic control group [cont: 12.9 ± 1.8 , normo: 20.8 ± 5.8 , micro: 26.1 ± 8.6 , macro: 23.5 ± 8.3). Microalbuminuric patients had significantly higher GA levels than normoalbuminuric patients ($p < 0.05$). Proteinuric subjects had slightly lower GA levels compared to microalbuminuric group but it was not statistically significant.

Conclusion: GA was found to be a better marker for evaluating short term glycaemic status among diabetic patients with different degree of renal impairment prior to ESRD.

Abstract

Cost of medical care among type 2 diabetic patients with a co-morbid condition—Hypertension in India

Shabana Tharkar, Kumpatla Satyavani, Vijay Viswanathan

DIABETES RESEARCH AND CLINICAL PRACTICE • VOL. 83 • 263–267 • 2009

The aim was to estimate the cost of medical care among hospitalized diabetic patients and to assess the influence of an additional co-morbid condition—hypertension. A pretested and validated questionnaire was interviewer administered among 443 (male:female, 235:208) hospitalized diabetic patients. The JNC VII criteria for hypertension was considered to divide the study population into two groups; group I – diabetic patients without hypertension (n=269) and group II – diabetic patients with hypertension (n=174). Details of cost of inpatient and out-patient care and expenditure on hospitalization for the previous 2 years were obtained. The prevalence of hypertension among the study subjects was 39.3% (174 subjects). Presence of hypertension made a significant impact on the expenditure pattern. On an average a diabetic patient with hypertension spent 1.4 times more than a diabetic subject without hypertension. Median cost per hospitalization, length of stay during admission, and cost of 2 years for inpatient admission were all significantly higher for diabetic patients with a co-morbid condition. There is a need to develop a protocol on cost effective strategy for diabetes care. Strict control of hypertension should be targeted to avoid excess treatment cost on diabetes care.

Abstract

Assessment of ulcer related outcomes in type 2 diabetic patients with foot ulceration in India

Vijay Viswanathan, Satyavani Kumpatla, Saraswathy Gnanasundaram, Gautham Gopalakrishna, Bhadendranath Das

THE JOURNAL OF DIABETIC FOOT COMPLICATIONS • VOL. 1 • 40–46 • 2009

Aim: The aim of this study was to assess the ulcer related and patient related outcomes in type 2 diabetic patients with foot ulceration in India.

Research design and methods: A total of 1143 (M:F, 756:387) consecutive type 2 diabetic neuropathic subjects with foot ulceration seen during

a period of 48 months were selected from a well established foot clinic of a tertiary care centre in India. Ulcer related outcomes were assessed. Details about smoking habits and presence of micro and macro vascular complications of diabetes were recorded. HbA1c% was estimated by immunoturbidimetric method. Neuropathy was diagnosed by vibration perception threshold. Education on foot examination had been carried out for all the patients and they had been provided with customized orthoses to reduce foot pressures.

Results: Approximately 60% of ulcers healed and remained ulcer free over a mean of 34.2 months period of observation. In contrast, 23.4% of ulcers never healed and recurrence was seen in 15.1% of the ulcers. Fifteen patients required an amputation and 5 of the patients died. The median number of days for the ulcer to heal was 241 days and a recurrent or a new ulcer developed after a median of 205 days. The median time for the patients to be free from ulcer was 6 months. Mean HbA1C % and prevalence of smoking were higher in recurrent ulcer and never healed patients, while usage of therapeutic foot wear was lower among them when compared with ulcer free patients.

Conclusions: The present study showed that about 60% of ulcers healed and remained ulcer free over a 34.2 months period of observation. Recurrence of healed ulcers occurred in only one sixth of patients and amputation in this large series was necessary in just over 1% of subjects.. It is possible to reduce the burden of foot problems by educating patients on foot care and by providing appropriate foot wear.

Abstract

Impact of socioeconomic status on prevalence of overweight and obesity among children and adolescents in urban India

Shabana Tharkar, Vijay Viswanathan

THE OPEN OBESITY JOURNAL • VOL. 1 • 9–14 • 2009

To determine the prevalence and risk factors of overweight and obesity among the school children aged 8-15 years. A cross sectional design was adopted and 3 schools (2 private and 1 corporation schools) were selected by stratified cluster-sampling technique. Data was collected by interviewer administered

method by trained research officers using a pre- tested and validated questionnaire to a total sample of 1193 school children from grades IV to X (i.e.) aged 8 to15 years. Prevalence rates were calculated using WHO-MI for age percentile chart 2007. Regression analysis was done to determine the risk factors associated with overweight. The overall prevalence of overweight was 12.1% among the children and 15.5 % among the adolescents. Both overweight (22%) and obesity (13.7%) were highest among girls from affluent families. The mean anthropometric measurements, prevalence of overweight and obesity were higher among the urban affluent children. Factors associated with overweight were upper socioeconomic status (OR-3.4, CI-1.8 to 6.7, $P<0.0001$) and greater than 2 hours television watching (OR -2.5, CI- 1.1 to 5.4, $P<0.0001$). The children had grossly inadequate knowledge about healthy lifestyle habits. Overweight and obesity are predisposing factors for many diseases. These findings suggest the need for early intervention programs, targeting the children from affluent society.

Abstract

Prevalence of lower urinary tract infection in South Indian type 2 diabetic subjects

Janifer J, Geethalakshmi S, Satyavani K, Viswanathan V

INDIAN JOURNAL OF NEPHROLOGY • VOL. 19 • 107–111 • 2009

This study was done to determine the prevalence of lower urinary tract infection (UTI), the causative pathogens, their antimicrobial pattern, and the recurrence of infection in type 2 diabetic subjects. A total of 1157 (M: F 428: 729) type 2 diabetic subjects were selected for this study. Midstream urine specimens were collected and the culture tests were done by a quantitative method whereas antimicrobial sensitivity was determined by using the Kirby-Bauer method. A significant colony count was seen in 495 (42.8%) subjects and an insignificant count in 350 (30.3%) subjects; there were a few cases of recurrent UTI. Women (47.9%) had a significantly higher prevalence of UTI than men (34.1%) ($\chi^2=20.3$, $P<0.0001$). Except for BMI, UTI was significantly associated with age, duration of diabetes, and poor glycemic control in both sexes. About 533 pathogens of gram positive and gram negative bacilli were isolated from 495 subjects in this study. Escherichia coli (E. coli) was the most commonly found organism. Gram negative pathogens were

found to be highly sensitive to sulbactam/cefoperazone and piperacillin/tazobactam. The prevalence of UTI was significantly higher in women than men with *E. coli* being the major isolated pathogen. Gram negative pathogens were highly sensitive to sulbactam/cefoperazone and piperacillin/tazobactam.

Abstract

Prevalence of metabolic syndrome among Asian Indian subjects with elevated intermediate glucose response during OGTT

Viswanathan V, Satyavani K, Michael C, Tilak P

DIABETES RESEARCH AND CLINICAL PRACTICE • VOL. 83 • e17–e18 • 2009

EGI which is a distinct entity showed a significantly higher prevalence of metabolic syndrome compared to normal subjects. There is an urgent need of some intervention strategies for this high risk individuals to reduce future risk of diabetes and CVD.

Abstract

Oxidative stress markers regulating the healing of foot ulcers in patients with type 2 diabetes

Shiny John Vairamon, Mary Babu, Vijay Viswanathan

WOUNDS • VOL. 21 • 273–279 • 2009

Objective: This study was aimed at identifying factors that affect the healing of foot ulcers among patients with type 2 diabetes, focusing on the evaluation of oxidative stress – one marker of the inflammatory response.

Methods: A cross-sectional study comprised of 96 subjects who were divided into 6 groups (16 subjects in each group). The groups were classified as non-diabetic control (group I), diabetic subjects without foot ulcer (group II), diabetic subjects with foot ulcers were sub-divided as neuropathic ulcer-noninfected (group III), neuropathic ulcer-infected (group IV), neuroischemic ulcer-noninfected (group V), and neuroischemic ulcer-infected (group VI). Oxidative stress markers such as lipid peroxidation, thiobarbituric acid reactive substance (TBARS), superoxide dismutase (SOD), catalase, G-peroxidase, GS-peroxidase, and plasma total antioxidant status were assayed in the blood samples.

Results: Lipid peroxidation increased progressively from group I to group VI subjects ($P < 0.001$). The TBARS in erythrocyte membrane was higher than in plasma. A progressive decrease of the total antioxidant status in plasma from group III to group VI ($P < 0.01$) was noted. There was a triggering increase in the antioxidative enzymes SOD and catalase in group V and group VI.

Conclusion: There is a high level of lipid peroxidation with insufficient antioxidant enzymes and decreased total antioxidant status in plasma that leads to chronic ulceration and an extended inflammatory reaction. Thus, oxidative stress may be regarded as an important factor in nonhealing diabetic foot ulcers among patients with type 2 diabetes.

Abstract

Development and evaluation of a training programme on primary prevention of diabetes for primary care physicians

Shabana Tharkar, Karunanithi Kathiresan, Pintochan Abraham, Vijay Viswanathan

INTERNATIONAL JOURNAL OF HEALTH RESEARCH • VOL. 2 • 305–314 • 2009

Purpose: To strengthen the capacity of primary care physicians in prevention and control of diabetes in Tamilnadu State in India.

Methods: A 2-day workshop focusing on diabetes, its prevention and control was carried out. The impact of the training programme was evaluated in two parts – (i) knowledge assessment done by administering a tool to the doctors before the start and towards the end of the sessions and (ii) clinical practice assessment - interviewing the doctors to assess diabetes service delivery, after six months.

Results: A significant improvement in identification of risk factors and high risk groups, primary prevention methods, screening and diagnostic procedures and treatment of diabetes by the physicians were observed. After 6 months, considerable improvement in diabetic care delivery to patients at community level was observed and some physicians had started organizing screening and awareness campaigns in their communities.

Conclusion: Diabetic health care at primary health care level can be considerably improved through sensitization and effective educational programmes.

Abstract

Comparative analysis of transcription factors of insulin signaling (Insulin receptor substrate family)

Sampoornam Balakrishnan, Satyavani Kumpatla, Vijay Viswanathan

INDIAN JOURNAL OF BIOTECHNOLOGY • VOL. 9 • 24–30 • 2010

The aim of this study was to identify the role of insulin receptor substrates (IRS) in insulin signaling by doing sequence based comparative analysis. The sequences of IRS family (1, 2, 4, 5 & 6) were submitted to predict protein motif scan and clustal W for motif, domain identification and multiple sequence alignment. All the 5 IRS had some common motifs like amidation, Asn cAMP, casein kinase II, protein kinase C phosphorylation sites and functional domains like PTB and PH. Some functional motifs like tyrosine phosphorylation, Rho kinase a binding, OGFR, PSGP were identified in IRS-1, RGD motifs in IRS-1 and 4, XYPPX motif and ECM protein domain in IRS-2, NLS motif and extension like domain in IRS-2 and 4, ascorbate cytosolic peroxidase, class It peroxidase superfamily domain, NHL and 2 octapeptide repeats and ATPGTP attachment sites in IRS-4. These domains and motifs may have inducing and inhibitory effects on insulin signaling.

Abstract

Clinical significance of urinary Monocyte Chemoattractant Protein-1 (uMCP-1) in Indian type 2 diabetic patients at different stages of diabetic nephropathy

Priyanka Tilak, Zenith Khashim, Satyavani Kumpatla, Mary Babu, Vijay Viswanathan

INTERNATIONAL JOURNAL OF DIABETES MELLITUS • VOL. 2 • 15–19 • 2010

Objective: Monocyte Chemoattractant Protein-1 (MCP-1) is the strongest known chemotactic factor for monocytes and is upregulated in diabetic nephropathy. So measuring urinary MCP-1 is of great significance in the diagnosis and intervention of early diabetic nephropathy. This study aims at determining the levels of urinary MCP-1 (uMCP-1) at different stages of diabetic nephropathy and to see its correlation with other parameters in Indian type2 diabetic subjects.

Materials and methods: A total of 64 (M:F; 40:24) type 2 diabetic subjects were divided into three groups based on their renal function and were compared with non-diabetic controls (Group 1) n=20 (M:F; 13:7). The study groups were Group 2 (normoalbuminuria) n=16, Group 3 (microalbuminuria) n=23 and Group 4 (macroalbuminuria) n=25. Demographic, anthropometric and biochemical details were recorded for all the subjects. Urinary MCP-1 levels were measured by using solid phase ELISA method.

Results: Mean levels of uMCP-1 in subjects with type 2 diabetes were significantly higher than in controls ($p < 0.05$). The levels of uMCP-1 in type 2 diabetic subjects increased gradually with deteriorating renal function ($p = 0.006$). There was a significant difference in urinary MCP-1 levels between Group 2 and Group 1 ($p < 0.001$). Levels of uMCP-1 were significantly higher in subjects with eGFR < 60 ml/min compared to eGFR 60 ml/min ($p = 0.008$). uMCP-1 levels correlated positively with uACR or uPCR ($r = 0.551$, $p < 0.0001$), urea ($r = 0.43$, $p < 0.0001$) and creatinine ($r = 0.478$, $p < 0.0001$). A negative correlation between uMCP-1 and eGFR ($r = -0.338$, $p = 0.006$) was noted.

Conclusion: Our study demonstrated that urinary MCP-1 levels increased gradually in type 2 diabetic subjects with deteriorating renal function. It is significantly associated with the other risk factors of diabetic nephropathy.

Abstract

Association of non-alcoholic fatty liver disease with diabetic microvascular and macrovascular complications in South Indian diabetic subjects

Vijay V, Mahesh K, Srikanth M, Satyavani K

INTERNATIONAL JOURNAL OF DIABETES IN DEVELOPING COUNTRIES • VOL. 30 • 208–212 • 2010

Aims: Nonalcoholic fatty liver disease (NAFLD) is a common liver disorder that is strongly associated with insulin resistance and type 2 diabetes. This study was designed to evaluate whether there is an association between NAFLD and diabetic micro- and macrovascular complications among diabetic subjects.

Materials and methods: The subjects were selected from 2161 (M:F; 1187:974) type 2 diabetic patients who had undergone ultrasound of abdomen for

assessment of fatty liver. A total of 156 patients with evidence of NAFLD (group 1) were compared with 142 (group 2) patients with normal liver ultrasound and the presence of micro- and macrovascular complications of diabetes were recorded. Multiple logistic regression analysis was performed using NAFLD as the dependent variable. Independent variables included were age, gender, duration of diabetes mellitus (DM), body mass index (BMI), nephropathy, neuropathy, retinopathy, peripheral occlusive vascular disease (POVD), and coronary artery disease (CAD).

Results: Prevalence of obesity, hypertension, and dyslipidemia were significantly higher in subjects with NAFLD. They had higher prevalence of retinopathy (29.4% vs. 9.8%, $P < 0.001$), neuropathy (27.5% vs. 10.5%, $P < 0.001$), nephropathy (32% vs. 25%, $P = 0.2$). The prevalence of CAD among NAFLD (11.5% vs. 1.4%, $P = 0.01$) was higher and POVD was similar in both the groups. The results of multiple logistic regression analysis showed that NAFLD was associated with BMI, retinopathy, neuropathy, and CAD.

Conclusions: NAFLD as diagnosed by ultrasound was associated with micro- and macrovascular complications of diabetes. The prevalence of obesity, hypertension, and dyslipidemia were significantly higher in subjects with NAFLD.

Abstract

The socioeconomics of diabetes from a developing country: A population based cost of illness study

Shabana Tharkar, Arutselvi Devarajan, Satyavani Kumpatla, Vijay Viswanathan

DIABETES RESEARCH AND CLINICAL PRACTICE • VOL. 89 • 334–340 • 2010

Objective: To assess the annual health care expenditure for a patient with diabetes and extrapolate the same to country specific prevalence estimates for 2010.

Methods: This population based, cost of illness study collected retrospective data for last 12 months on direct costs (medical and non-medical) through records, indirect cost through human capital approach and intangible cost by contingent valuation method from diabetes patients.

Results: Out of 4677 subjects screened, 1050 had diabetes and 718 participated in the survey. The median annual direct and indirect

cost associated with diabetes care was estimated at 25,391 INR (\$525.5) and 4970 INR (\$102.8), respectively. Extrapolating the direct and indirect estimates to Indian population, the annual costs for diabetes would be 1541.4 billion INR (\$31.9 billion) in 2010. Two-way sensitivity analysis assuming 10% variation in both prevalence of diabetes and in treatment costs resulted in an estimated cost range of 1230 billion INR (\$25.5 billion) to 1837.3 billion INR (\$38.0 billion).

Conclusion: Keeping the future diabetes explosion in mind, this heavy economic burden highlights the urgent need for the decision makers to allocate resources for planning and implementing strategies in prevention and management of diabetes and its complications.

Abstract

Insulin resistance at different stages of diabetic kidney disease in India

Viswanathan V, Tilak P, Meerza R, Kumpatla S

JOURNAL OF ASSOCIATION OF PHYSICIANS OF INDIA • VOL. 58 • 612–615 • 2010

Objective: Many studies showed that Insulin resistance (IR) is present in chronic renal failure and evidences suggest that IR can also occur in early stages of renal disease. There is paucity of data from India, hence this study was planned to assess the degree of Insulin resistance at different stages of diabetic nephropathy.

Study subjects and methods: This is a cross sectional study with a total of 128 subjects (M: F; 81:47) divided into 3 groups based on their renal function, Group 1 (control) n=32, group 2 (Normoalbuminuria) n=26, group 3 (Microalbuminuria) n=59 and group 4 (Macroalbuminuria) n=43. Subjects on insulin treatment were excluded. Insulin was estimated by chemiluminescence method. Biochemical investigations were done by enzymatic procedures. Insulin resistance was calculated using HOMA method. The normal cut off value for HOMA IR (2.4) was derived using mean+2SD of control group.

Results: There was no significant difference between the study groups with respect to age, BMI, duration of diabetes and glycemic control. Mean HOMA IR increased significantly with decreasing renal function (control: 1.30 +/- 0.53; Normo: 4.0 +/- 2.7; Micro: 5.8 +/- 4.1; Macro: 7.9 +/- 5.1, p<0.0001). Larger percentage of subjects had HOMA IR (> or = 2.4) at different

stages of diabetic kidney disease (Normoalb: 57.6%; Microalb: 76.2%, Macroalb: 90.6%) compared to normal (3.1%). The results of multiple logistic regression analysis showed an association between HOMA IR and diabetic nephropathy.

Conclusion: This cross-sectional study demonstrated an association between IR and diabetic kidney disease in Indian population with type 2 diabetes. Further prospective studies are needed to look for causative relationship between IR and renal function.

Abstract

Comparison of post amputation outcome in patients with type 2 diabetes from specialized foot care centres in three developing countries

Vijay Viswanathan, Jawadur Rahim Wadud, Sivagami Madhavan, Seena Rajasekar, Satyavani Kumpatla, J.K. Lutale, Zulfiqarali G. Abbas

DIABETES RESEARCH AND CLINICAL PRACTICE • VOL. 88 • 146–150 • 2010

Objective: To evaluate post amputation outcome and associated complications in type 2 diabetic patients who had undergone major amputations in developing countries.

Patients and Methods: A total of 526 (M:F; 369:157) subjects from three centers [India (IND), n=194, Bangladesh (BAN) n=177 and Tanzania (TAN) n=155 who had undergone amputation and subsequently visited the hospital were included in this analysis. Details on foot problems and associated complications were recorded.

Results: The prevalence of amputations was similar in all centres. The history of minor amputation and foot deformity was high in BAN. Recurrence of foot ulceration was more in TAN (30%) than in IND (9%) and BAN (11%). Re-amputation rate was similar in all groups (3%). The use of artificial limb was most in BAN (97%). Myocardial infarction was more prevalent in IND (15%). In Tanzania, 31% had died during the follow-up period and it was 16% and 5% in IND and BAN. The causes of death were infection due to septicemia and cardiovascular events which finally led to multisystem organ failure.

Conclusion: The outcome following a major diabetic foot amputation was compared in three developing countries. Recurrence of foot infection was common in Tanzania. The most frequent causes of death were infection and cardiovascular events.

Abstract

Effect of obesity on cardiovascular risk factors in urban population in South India

Shabana Tharkar, Vijay Viswanathan

HEART ASIA • VOL. 2 • 145–149 • 2010

Background: Non-communicable diseases are on the rise globally, and developing countries are also witnessing the burden. Rising obesity levels are a matter of serious concern owing to the well-established link between obesity and non-communicable diseases. The objective of this study was to determine the effect of obesity on the prevalence of cardiovascular risk factors among the Indian population.

Methods: Data on blood pressure, anthropometric and biochemical measurements were collected for 2021 subjects aged above 20 years. Measurements were restricted to only anthropometrics for those below 20 years (N=1289). The study population was categorised into three groups according to body mass index for statistical analysis.

Results: The prevalence of overweight and obesity was 29.5% and 11.1%, respectively, which shows significant rising trends since 1995. Glucose intolerance, dyslipidaemia, hypertension and metabolic syndrome were significantly higher among the overweight and obese subjects than among normal subjects. The prevalence of metabolic syndrome was 59% among the obese group, showing the highest risk for that group. Overweight and obesity, increasing age, hypercholesterolaemia and family history of hypertension showed a strong association with metabolic syndrome.

Conclusion: All the cardiometabolic abnormalities showed an increasing trend with increase in body mass index. The morbidity and mortality associated with cardiovascular diseases can be reduced by curbing the obesity epidemic.

Abstract

Knowledge and outcome measure of HbA1c testing in Asian Indian patients with type 2 diabetes from a tertiary care center

Satyavani K, Medempudi S, Manoharan D, Viswanathan V

INDIAN JOURNAL OF COMMUNITY MEDICINE • VOL. 35 • 290–293 • 2010

Aim: HbA1c test is considered to be the reliable measure for evaluating long-term glycemic control in type 2 diabetes. The purpose of this study was to evaluate whether knowledge about HbA1c test is associated with a better glycemic control.

Materials and methods: We conducted a cross-sectional survey of 480 (M:F; 287:193) adults with type 2 diabetes attending a tertiary care center during a period of four months. Baseline demographic and clinical data of all the subjects was obtained. Subject's knowledge about HbA1c test and their target goal was assessed using a questionnaire. Recent HbA1c results were obtained from medical records.

Results: Seventy four per cent of the subjects had awareness about HbA1c test and about 43% of those who knew HbA1c test also knew their target goal. 33% remember their last HbA1c result. The mean A1C of Group A was significantly lower when compared with Group B (8.1 ± 1.7 vs 9.2 ± 1.9 , $P < 0.0001$). Group C had lower A1C levels compared to Group D (7.7 ± 1.4 vs 8.5 ± 1.9 , $p < 0.0001$). Patients who kept their HbA1c less than 7% were significantly higher in Group C than in Group D. (37.8 vs 12.7%, $p < 0.00001$). Subjects had good glycemic control with increasing levels of awareness about HbA1c.

Conclusion: Majority of the diabetic patients who attended the tertiary care center for diabetes care knew HbA1c test and half of them were aware about their target goal. Awareness about HbA1c had a positive impact on maintenance of better glycemic control.

Major Events Conducted by Prof. M. Viswanathan Diabetes Research Centre

ORATION AWARDS



Prof. M. Viswanathan Gold Medal Oration Award 2008 was presented to Dr. N.K. Sethi, Sr. Advisor (Health), Planning Commission of India, New Delhi, by Dr. S. Elango, Director of Public Health, Government of Tamil Nadu. Dr. Vijay Viswanathan, Managing Director, M.V. Hospital for Diabetes, is seen in the picture.



Diabetes Research Centre Gold Medal Oration Award 2008 was presented to Dr. B. Kasinath, M.D., FASN, Prof. of Medicine, University of Texas, by Dr. S. Elango, Director of Public Health, Government of Tamil Nadu. Dr. S.N. Narasingan, Dean of Studies, Dr. Vijay Viswanathan and Dr. N.K. Sethi, Sr. Advisor (Health), Planning Commission of India, New Delhi, are in the picture.



Prof. M. Viswanathan Gold Medal Oration Award 2009 was presented to Dr. Michael M. Engelgau, Senior Public Health Specialist, South Asia Human Development, World Bank, Washington DC, USA, by Padmasri Prof. Mayil Vahanan Natarajan, Vice Chancellor, Dr. M.G.R. Medical University, Chennai. Prof. S. Thanikachalam (extreme left) Dr. Vijay Viswanathan (centre) and Dr. S.N. Narasingan, Dean of Studies (extreme right), are seen in the picture.



Diabetes Research Centre Gold Medal Oration Award 2009 was presented to Dr. Rudolf W. Bilous, Professor of Clinical Medicine, Newcastle University, UK, by Padmasri Prof. Mayil Vahanan Natarajan, Vice Chancellor, Dr. MGR Medical University. Prof. V. Seshiah (1st from left), Prof. S. Thanikachalam (2nd from left), Dr. Vijay Viswanathan (5th from left), Dr. S.N. Narasingan (6th from left) and Dr. Michael M. Engelgau are seen in the picture.

LIFETIME ACHIEVEMENT AWARDS



Life Time Achievement Award 2009 was presented to Padmasri Prof. Mayil Vahanan Natarajan, Vice Chancellor, Dr. MGR Medical University, by Prof. S. Thanikachalam, Chairman & Director Cardiac Care Centre, Sri Ramachandra University, Chennai. Prof. V. Seshiah (1st from left), Dr. Vijay Viswanathan, (4th from left), and Dr. S.N. Narasingan, Dean of Studies (extreme right) are seen in the picture.



Life Time Achievement Award 2009 was presented to Prof. V. Seshiah, Chairman, Dr. V. Seshiah Diabetes Research Institute, by Prof. S.K. Rajan (1st from left). Prof. S. Thanikachalam (3rd from left), Padmasri Prof. Mayil Vahanan Natarajan (4th from left) and Dr. Vijay Viswanathan (extreme right) are also seen in the picture.



OTHER EVENTS



The launch of the DRC-WDF project on primary prevention of diabetes among tuberculosis patients / education and training in prevention of diabetes for tuberculosis health personnel held on June 14, 2009, at Hotel Taj, Mount Road, Chennai.



A seminar on “Socioeconomic impact of diabetes and its complications” was conducted by M.V. Hospital for Diabetes & Prof. M. Viswanathan Diabetes Research Centre on September 12, 2009, at Russian Cultural Centre, Teynampet, Chennai



Launch of Diastep™ footwear designed for people with diabetes and lower risk foot ulcers jointly by CLRI and M.V. Hospital for Diabetes and Prof. M. Viswanathan Diabetes Research Centre, held on November 2, 2009, at Hotel Savera, Chennai



1st Multinational Study Group meeting on Diabetic Foot & Wound Healing conducted at CLRI, Adyar, Chennai, during 12th – 13th December, 2009



Prof. S. Thanikachalam, Chairman & Director, Cardiac Care Centre, Sri Ramachandra University, Chennai (2nd from left) releasing the revised Manual on *"Socio Economics of Diabetes"* and the first copy was received by Padmasri Prof. Mayil Vahanan Natarajan, Vice Chancellor, Dr. M.G.R. Medical University (3rd from Left). Dr. Vijay Viswanathan (4th from left), Dr. S.N. Narasingan, Dr. Michael M. Engelgau, Sr. Public Health Specialist, World Bank (Extreme Right) are in the picture.



Inauguration of IMPRESSION 2010 (a campaign on lifestyle & diabetes) organized by the Department of Social-Educational and Psychological Health-Training and Research of Prof. M. Viswanathan DRC on September 30, 2010



Meet the Medical Experts (Panel Discussion on Diabetes for Public) organized by M.V. Hospital for Diabetes, Royapuram, at GRT Grand Convention Centre on November 14, 2010, on World Diabetes Day

HEALTH WALK BY SCHOOL CHILDREN



Screening Session



Prize Winners

Chennai Slim & Fit Programme :
Anti Obesity Day, November 26, 2010
at Sri Vasta Vivekananda Vidyalaya, Chitlapakkam, Chennai.

Seminars and CME Programmes conducted by Prof. M.V. DRC (2009-2010)

S. No.	Date	Topic	Speaker
1.	12.02.09	Prevention of type 2 diabetes and its complications: The Indian perspective	Dr. Vijay Viswanathan <i>Managing Director</i>
2.	12.03.09	Tight glycaemic control—How tight is right	Dr. Vijay Viswanathan <i>Managing Director</i>
3.	26.03.09	Diabetes and tuberculosis	Dr. Sarweswar Agarwal <i>Consultant Diabetologist</i>
4.	2.04.09	Management of diabetes during surgery	Dr. Mitalee Barman <i>Consultant Diabetologist</i>
5.	16.04.09	Management of diabetes mellitus in special cases of CCF & CKD	Dr. M. Deepa <i>Consultant Diabetologist</i>
		Referral to Diet Department	Dr. Varsha <i>Consultant (Nutrition Dept.)</i>
6.	9.07.09	Advances in diabetic foot management	Dr. Rajesh Kesavan <i>Consultant Podiatric Surgeon</i>
		Design and application of appropriate biological dressings to accelerate the healing process	Dr. Mary Babu <i>Retd. Scientist, CLRI</i>
7.	24.12.09	European Medicine Agency and overview of GCP	Dr. Anil Shinde <i>Head of Clinical Operation, Novonordisk</i>
8.	3.01.10	Discussion for a better approach of existing clinical trials	Dr. Vijay Viswanathan <i>Managing Director</i>
9.	7.01.10	Discussion on a common case seen in OP Department	Dr. Sripriya Shaji <i>Former HoD, Education</i>
10.	21.01.10	NICE-SUGAR study & glycemic management in ICU	Dr. Hiranmayi Sheshu <i>Consultant Physician</i>
11.	28.01.10	Managing a newly detected case of type 2 diabetes mellitus	Dr. Chandrasekar <i>Asst. Prof. of Medicine</i>

S. No.	Date	Topic	Speaker
12.	4.02.10	Assessing the value of diabetes education	Mrs. P.M. Reesha <i>Junior Diabetes Counsellor</i>
13.	18.02.10	Body contouring – updates	Dr. Karthick <i>Plastic Surgeon</i>
14.	25.02.10	Meal planning in a diabetic patient	Dr. Varsha <i>Consultant (Nutrition Dept.)</i>
15.	4.03.10	ECG class	Prof. V. Chokalingam <i>Senior Consultant Cardiologist</i>
16.	18.03.10	ADA Clinical Practice Recommendations 2010	Dr. Hemanga Barman <i>Consultant Diabetologist</i>
17.	29.04.10	Women and diabetes	Dr. Usha Sriram <i>Endocrinologist</i>
18.	6.05.10	Hypokalemia & Hyperkalemia	Dr. Bismay Kumar
19.	24.06.10	Weight Management Programme	Dr. Sripriya Shaji <i>Former HoD, Education</i>
20.	15.07.10	Diabetes and thyroid	Dr. Shriram Mahadevan <i>Consultant Endocrinologist</i>
21.	29.07.10	β -cell destruction and regeneration in autoimmune diabetes	Dr. C.B. Sanjeevi <i>Associate Professor, Karolinska Institutet Medical University, Stockholm, Sweden</i>
22.	12.08.10	Role of diabetes specific nutrition in hospitalized patients	Dr. Robert Kushner <i>Prof. of Medicine, North Western University, Chicago</i>
23.	19.08.10	Methods of diabetes education. A short note on newer drugs in the treatment of diabetes	Dr. A.J. Asirvatham <i>Prof. of Diabetology, Madurai Medical College</i>
24.	16.09.10	Diet Updates 3D	Dr. Varsha <i>Consultant (Nutrition Dept.)</i>
25.	23.09.10	Problems in achieving target blood sugar level	Dr. S.S. Lakshmanan <i>Consultant Physician, Priya Nursing Home, Royapuram</i>
	23.09.10	A case discussion on liraglutide	Dr. Vijay Viswanathan <i>Managing Director</i>
26.	7.10.10	Role of DPP-4 inhibitors in the management of type 2 diabetes mellitus: focus on saxagliptin	Dr. Hemanga Barman <i>Consultant Diabetologist</i>

S. No.	Date	Topic	Speaker
27.	14.10.10	Value of early diagnosis of type 2 diabetes	Dr. I. Ranjit Unnikrishnan <i>Consultant Physician, Dr. Mohan's Diabetes Specialities Centre & Madras Diabetes Research Centre, Chennai</i>
28.	21.10.10	Cystatin C assay	Ms. Brigitte Brand <i>Diasys Diagnostics, Germany</i>
29.	28.10.10	COPD as a systemic disease	Dr. Prasanna Kumar Thomas <i>Consultant Pulmonologist</i>
30.	18.11.10	A novel combination of metformin and acarbose	Dr. Hemanga Barman <i>Consultant Diabetologist</i>
31.	16.12.10	Fear about marriage and conception among youth with type 1 diabetes – an exploratory study	Dr. Sripriya Shaji <i>Former HoD, Education</i>
32.	23.12.10	Improving patients care – investigating a patient in a comprehensive diabetic health care system	Dr. Mitalee Barman <i>Consultant Diabetologist</i>



Diabetes Research Centre awarded the following Gold Medal Oration Awards to distinguished scientists and researchers, in the field of Medical Care and Research. These awards carry a Citation and the Gold Medal.

- a) Prof. M. Viswanathan Gold Medal Oration Award
- b) DRC Gold Medal Oration Award
- c) Prof. M. Viswanathan Endowment Public Lecture Award

The following is the list of distinguished and internationally known Scientists and Researchers in the field of Diabetes Care and Research and other fields of medical care and research who have received these Awards.

1. Dr. M.M.S. Ahuja, Professor of Medicine, AIIMS, New Delhi, India.
2. Dr. S. Podolsky, Chief of Diabetes, V.A. Hospital, Boston, USA.
3. Dr. J.S. Bajaj, Professor of Medicine, AIIMS, New Delhi, India.
4. Dr. Z. Skrabalo, Director of the Institute for Diabetes Endocrinology and Metabolism, Zagreb, Yugoslavia.
5. Dr. Eva Kohner, Senior Lecturer in Medicine, and Head of Diabetic Retinopathy Unit, Hammersmith Hospital, London, UK.
6. Dr. Paul Zimmet, Professor of Medicine and Diabetologist, Royal Southern Memorial Hospital, Melbourne, Australia.
7. Dr. E.F. Preiffer, Professor of Medicine, Department of Internal Medicine, University of Ulm, West Germany.
8. Dr. B.M. Ogilvie, Deputy Director (Science), Wellcome Trust London, UK.
9. Dr. Malcolm Natrass, Physician and Diabetologist, University of Birmingham, UK.
10. Dr. R.J. Dash, Professor and Head, Department of Endocrinology, Post Graduate Medical School, Chandigarh, India.
11. Dr. Graham A. Hitman, London Hospital, White Chapel, London, UK.
12. Dr. Peter Bennett, Chief, Phoenix Epidemiology and Clinical Research Branch, National Institute of Health Arizona, USA, & Director of the WHO Collaborating Centre for Research in NIDDM.
13. Prof. Marja-Riita Taskinen, University of Helsinki.

14. Prof. Steven M. Haffner, University of Texas, USA.
15. Prof. Jaako Tuomilehto, Professor of Epidemiology and Head of Diabetes Genetic Epidemiology Unit, National Public Health Institute, Helsinki.
16. Prof. Eva Tuomilehto, Senior Researcher, Finnish Academy, Helsinki.
17. Prof. Bibhuti Bhusan Tripathy, Post Graduate Professor of Medicine, S.C.B. Medical College, Cuttack, Orissa, India.
18. Prof. David Robert Rhys Williams, Professor of Epidemiology & Public Health, University of Leeds, UK.
19. Dr. S.S. Badrinath, Medical Director, Sankara Nethralaya, and Professor of Ophthalmology, C. U. Shah Postgraduate Training Centre, Chennai, Tamil Nadu, India.
20. Prof. Hilary Owen Meredith King, Responsible Officer for Diabetes Mellitus, Division of Non Communicable Diseases, World Health Organization, Geneva, Switzerland
21. Prof. B. Ramamurthy, Head of the Department of Neurosurgery, Voluntary Health Services, Chennai, Tamil Nadu, India.
22. Prof. Graham Hitman, Professor of Molecular Medicine, Royal London School of Medicine, London.
23. Prof. Clive Stewart Cockram, Professor of Medicine and Honorary Consultant Physician (Endocrinology), Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong, China.
24. Mrs. A.V.M. Foster, Chief Podiatrist, King's College Hospital, London, UK.
25. Prof. Giancarlo Francesco Viberti, Professor of Diabetes and Metabolic Medicine at GKT School of Medicine, King's College of London, UK.
26. Prof. Frank Vinicor, Director of Diabetes Translation, National Centre for Chronic Disease Prevention and Health Promotion, Atlanta, Georgia.
27. Prof. Stephen Colagiuri, Department of Endocrinology, Diabetes and Metabolism, Prince of Wales Hospital, Australia.
28. Prof. Aristidis Veves, Research Director, Joslin-Beth Israel Deaconess Foot Centre, USA.
29. Prof. C.V. Bhirmanandham, Vice-Chancellor, Tamil Nadu Dr. M.G.R. Medical University, Chennai, Tamil Nadu, India.

30. Prof. Hans-Henrik Parving, Chief Physician, Steno Diabetes Center, Copenhagen, Denmark, and Professor of Medicine at the University of Aarhus, Denmark.
31. Prof. Hertzell C. Gerstein, Professor of Medicine McMaster University, and Director of Division of Endocrinology & Metabolism, McMaster University Hamilton, Canada.
32. Prof. Pierre J. Lefebvre, Emeritus Professor of Medicine, University of Liege, Belgium, and President of International Diabetes Federation and Chairman of World Diabetes Foundation.
33. Prof. Andrew J.M. Boulton, Professor of Medicine, University of Manchester, UK, and Professor of Medicine, University of Miami School of Medicine, Florida, USA.
34. Dr. Mahendra A. Wijesuriya, Consultant Physician & Diabetologist, and President, Diabetes Association of Sri Lanka, Colombo.
35. Dr. R.A. Mashelkar, Director General, CSIR, and Secretary, Government of India, Department of Scientific & Industrial Research, New Delhi.
36. Prof. Philip David Home, Professor of Diabetes Medicine, University of Newcastle Upon Tyne, UK, and Consultant Physician in Diabetes, Metabolic and Acute General Medicine, Newcastle Upon Tyne Hospitals, NHS Trust.
37. Prof. Sally Margaret Marshall, Professor of Diabetes, University of Newcastle Upon Tyne, UK Honorary Consultant Physician, Newcastle Upon Tyne Hospitals, NHS Trust.
38. Dr. Roglic Gojka, Responsible Officer, World Health Organization, Geneva, Switzerland.
39. Dr. T. Ramasami, Secretary, Department of Science and Technology, Government of India, New Delhi, India.
40. Dr. B. Kasinath, Professor of Medicine, University of Texas, USA.
41. Dr. N.K. Sethi, Senior Advisor (Health), Planning Commission of India, New Delhi, India.
42. Dr. Rudolf W. Bilous, Professor of Clinical Medicine, Newcastle University, UK.
43. Dr. Michael M. Engelgau, Senior Public Health Specialist, South Asia Human Development, World Bank, Washington DC, USA.





The Research Library established and developed under the directions of the Founder Director Prof. M. Viswanathan has grown steadily to become one of the foremost Research and Reference libraries in Diabetology. It is now a recognised resource by the medical fraternity. The Library is now housed in specially designed portion of the building. Eminent diabetologists from all over the world have complimented DRC for having a Research Library of exceptional merit. Those who study in the Library find the accommodation and ambience conducive for scholarly work.

The Library has a well-organised indexing system under Dewey Decimal Classification (DDC). It has fully computerised library data. The computerised system can retrieve instantaneously information regarding books and journals required by the users and generate reports required by the management. Photocopying facilities are available in the Library and students from different academic institutions make use of the Library facilities. One of the unique features of our Library is a separate reprint section. We have a collection of over 5,000 reprints on various aspects of diabetes, which are classified and available for ready references.

The Library subscribes to various National and International journals in the field of diabetology, internal medicine, biochemistry, microbiology and nutrition. The Library has Internet facilities and the postgraduate students and research scholars utilise this facility for upgrading their knowledge. The users can access databases like Medline and MedLar and can also access the international medical journals published online.

List of Journals with the Subscription Year

1. Balance: 1985
2. Bulletin of the World Health Organization: 2009
3. Clinical Chemistry: 1989
4. Clinical Trial: 2010
5. Clinics in Podiatric Medicine and Surgery: 2011
6. Diabetes: 1962
7. Diabetes Care: 1978
8. The Diabetes Educator: 1989
9. Diabetes Medicine: 1984
10. Diabetes Research and Clinical Practice: 1985
11. Diabetes Update: 1999
12. Diabetes Voice: 2002
13. Diabetologia: 1965
14. Indian Journal of Medical Research: 1993
15. Indian Journal of Nephrology: 2002
16. International Journal of Diabetes in Developing Countries: 2004
17. International Wound Journal: 2009
18. Journal of Association of Physicians of India: 1984
19. Journal of Indian Medical Association: 1993
20. The Asian Journal of Diabetology: 2006
21. The New England Journal of Medicine: 2001
22. University News: 2009



Diabetes Research Centre Foundation, a non-profit non-commercial organization, is an internationally known and respected centre of excellence in diabetes care and research. The mission of the Foundation is to undertake basic, epidemiological and clinical research in diabetes mellitus. We are taking up several research projects for the benefit of the community at large, as part of our crusade against diabetes.

State-of-the-art research in this field calls for heavy financial investment to establish and maintain the required physical facilities and acquire the necessary sophisticated laboratory equipments and other facilities such as maintaining and updating a modern research and reference library.

Being a non-profit organization, Diabetes Research Centre depends on donations for promotion of its research activities. We look forward to your donations to remain in the forefront of diabetes care and research and carry on our relentless crusade against diabetes and its complications. This will be a contribution to science and society and help to improve the lives of millions of diabetic patients.

Donations to the Diabetes Research Centre Foundation, Chennai, are given 175% exemption from Income Tax under section 35, sub-section (i) Clause (ii) of the Income Tax Act, 1961.



Prof. M. Viswanathan Diabetes Research Centre