Mr. Robin Singh, cricketer and coach of Mumbai Indians, inaugurating the Diabetic Amputees Forum at a function.

From L – R : Dr. J. Nagarathanam, Chief Executive, M.V. Hospital, Dr. Vijay Viswanathan, Managing Director and Dr. Uma Mahesh, Senior Diabetologist, M.V. Hospital.

The Chennai Amputees Forum was launched on 3 December 2011, on the occasion of the International Day for persons with disabilities. This forum was officially inaugurated by Mr. Robin Singh, cricketer, at a function held in Hotel Savera.

The Diabetic Amputees Forum is an organization for amputees from all over Tamil Nadu and its neighbouring states. A public meeting will be held on 3rd December each year on the occasion of the International Day for persons with disabilities where the members of this forum will address people with diabetes and talk about their experiences and also be advised about diabetes foot care. These amputees will be given education on diabetic foot care and they in turn will advise other diabetic patients on proper diabetic footcare and prevention of amputation.

All the members of the forum will be given free diabetes checkups once a year and provided free footwear for their healthy leg and free walkers to help them walk.
From the Editor’s Desk

Dear Reader,

Season’s Greetings from M.V. Hospital for Diabetes & Prof. M. Viswanathan Diabetes Research Centre.

I am happy to present you the first issue of this year’s Crusade. To help the Diabetic Amputees we have started a forum called Diabetic Amputees Forum, which will help to create more awareness among the public about the complications of Diabetes.

This issue of Crusade also has information on LADA or Latent Autoimmune Diabetes of Adulthood which is a relatively new kind of diabetes that affects adults and shares some features of both Type 1 and Type 2 diabetes.

This issue contains information on various complications of Diabetes such as Diabetic Nephropathy, Diabetic Neuropathy and Gestational Diabetes.

I wish you a healthy year 2012.

Regards,

Dr. Vijay Viswanathan,  
MD, PhD, FRCP (London) FRCP (Glasgow)  
Managing Director  
M.V. Hospital for Diabetes (P) Ltd

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LADA (Latent Autoimmune Diabetes of Adulthood), or Type 1.5 (type one-and-a-half) diabetes

Dr. Mitalee Barman, Consultant Diabetologist
M.V. Hospital for Diabetes

Till recently, people had either Type 1 diabetes (where the body stops making insulin) or Type 2 diabetes (where insulin is produced but the body cannot use it). There was also gestational diabetes – high blood glucose levels during pregnancy, which with good prenatal care, returned to normal after delivery.

LADA or Latent Autoimmune Diabetes of Adulthood is a relatively new kind of diabetes that affects adults and shares some features of both Type 1 and Type 2 diabetes.

Doctors came across LADA in the 1970s while they were conducting tests to identify proteins called autoantibodies in the blood of people with type 1 diabetes. As part of their study, the researchers also looked for the same autoantibodies in the general population and in people with type 2 diabetes (which is not an autoimmune disease). The proteins were almost absent in the general population, but they were seen in about 10 percent of people diagnosed with Type 2 diabetes.

How is LADA different from Type 1 and Type 2 Diabetes?

LADA is a genetically-linked, hereditary autoimmune disorder where the body confuses the pancreas with foreign bodies and reacts by attacking and slowly destroying the insulin-producing beta islet cells. But the attack is a slow progressive one with LADA, compared to the fast and aggressive attack on the beta cells in Type 1 diabetes. These same proteins are absent in those with Type 2 diabetes.

LADA has genetic features of both Type 1 and Type 2. Genetic testing recently revealed that people with LADA not only have immunity-related genetic errors very similar to people with juvenile onset Type 1 diabetes but also have defects in a gene, TCF7L2, (responsible for insulin resistance), that are frequently found in people with Type 2.

So LADA appears to be between Types 1 and 2 though perhaps it is more like Type 1. The difference between LADA and classic Type 1 is the speed with which beta cells are destroyed. People with LADA may take up to a decade to lose all their insulin-secreting capacity whereas in some people with Type 1 it can happen within a week!

People with type 1 become dependent on insulin at diagnosis while those with LADA usually need it within 6 years and Type 2 takes a lot more time, if at all necessary.

Age of onset of LADA is typically over the ages of 25-30 years and the first manifestation imitates Type 2 symptoms. Type 1 diabetes is more commonly diagnosed in childhood or under the age of 25, however, LADA shows a striking resemblance to the juvenile form of Type 1.

Progression to insulin dependence in Type 1 is rapid (days or weeks). In cases of LADA it may be delayed (months to years) and in Type 2 it is very slow.

Many LADA patients are slender and active instead of being overweight and sedentary as most Type 2 diabetes patients are. But not all people with LADA are slim. People with defective autoimmune genes are also likely to get thyroid disease and rheumatoid arthritis both...
of which can promote obesity. Thyroid disease which is not treated correctly makes a person obese, and people with rheumatoid arthritis cannot exercise too much and in addition, this is often treated with steroids that promote weight gain.

Unlike Type 2 diabetes patients, **people with LADA have little or no insulin resistance**. But like Type 2 diabetes patients, those with LADA **have some remaining healthy beta cells** -- at least in the beginning. So, at first they can keep their blood glucose under control with diet and oral medications. **The typical person with LADA requires insulin injections usually within 6 years which is much quicker than the average person with Type 2 diabetes.**

### How is LADA diagnosed?

Due to its similarities to Type 1 and Type 2, LADA can often be misdiagnosed as Type 2 diabetes as it initially mimics non-obese type 2 diabetes.

The main difference between LADA and Type 2 diabetes is that there is an autoimmune response present with LADA that is similar to that of Type 1 diabetes.

The only way to confirm whether a person has Type 2 diabetes or LADA is to test adults, especially those who are thin or normal weight, for the presence of auto antibodies. The antibodies tested for are: GAD antibodies, Islet cell antibodies, and more rarely, tyrosine phosphatase antibodies.

### Tests that detect LADA

1. A fasting C-peptide test. If the value is low, it suggests LADA.
2. GAD (glutamic acid decarboxylase test) and Islets antibody tests. High levels of these antibodies show the presence of LADA and can also predict the rate of progression towards insulin dependency. Higher levels of antibodies suggest a faster progression to insulin. Low levels of antibodies relate to type 2 diabetes and people are more likely to be overweight, have some insulin resistance and respond to tablets that act on insulin resistance.

Very high antibody levels are similar to type 1 diabetes and people are likely to have acute symptoms (thirst, unexplained weight loss, frequent urination, dry mouth), are less likely to be overweight and may need insulin treatment soon after diagnosis.

### Symptoms

LADA has the classic symptoms of diabetes. These are increased thirst, increased need to urinate, fatigue, dry mouth, blurry vision, and slow healing of cuts or sores.

### Other indicators of LADA

- The symptoms appear over a period of several weeks or longer,
- There is someone with Type 1 diabetes in the close family,
- The person has another autoimmune condition such as Rheumatoid Arthritis or Coeliac disease.
- Blood sugar remains high despite treatment with oral drugs and carbohydrate restriction.

**It is important to know whether you have LADA or T2DM**

Knowing whether you have LADA or Type 2 diabetes is important, because management of the two conditions differs. Type 1 diabetes that begins at any age requires a finely tuned insulin regimen, while people with Type 2 diabetes sometimes do not need insulin at all or, when they do, may need injections just once a day.

**People with LADA are often thin, so if you are thin and have been diagnosed with Type 2 diabetes, test for LADA.**

### Managing LADA

- As with other types of diabetes, eat a healthy, balanced diet and be active.
- Reducing carbohydrate intake and using less starchy vegetables should help to control blood sugar levels.
- The sooner insulin is started the easier it will be to control blood sugar. Insulin injections may be able to stop the attack on beta cells completely.
• **Counseling, therapy and participation in support groups** can play an important and positive role in the lives of persons with LADA.

• **It is important to learn** about diet, exercise, stress management, and how to handle diabetes on sick-days. Patients need to understand how to **recognize, treat, and prevent hypoglycemia** (low blood sugar) and **hyperglycemia** (high blood sugar).

• **Blood glucose levels should be checked.** The doctor will provide target ranges for blood glucose levels and how often it needs to be tested.

**Treatment for LADA**
Initially, a person with LADA may respond to oral diabetes medications and lifestyle changes, however, beta cells continue to be destroyed and LADA patients should be closely monitored. Once blood glucose can no longer be managed through lifestyle and medications, daily insulin injections will be required.

**Long-term complications of LADA**
The risk of long-term effects are directly related to how well the disease is managed from **time of onset** as well as **over a period of time**.

Uncontrolled diabetes results in high blood glucose levels (hyperglycemia) which, over time may cause, diabetic neuropathy, diabetic retinopathy, kidney failure, heart disease, high blood pressure, stroke, peripheral arterial disease (PAD), chronic infections and wounds that may not heal, erectile and other urologic dysfunction, gastroparesis (delayed emptying of stomach contents), blindness, amputation, lactic acidosis, and diabetic ketoacidosis (DKA).

LADA patients will become dependent on insulin to keep blood glucose control, but it is possible to lead a normal life. Patient education, motivation, and state of mental health all play an important role in how well a person with LADA will be able to manage their disease.

**Food for thought**
A few decades ago this was a rare syndrome. Could this rapid increase be the result of environmental pollution? Chemicals, radiation, and viruses can all cause cancer in people in which case they could also be a reason for autoimmune diabetes in people with defects in their autoimmune genes.

**The Warning Signals for LADA**

• You are diagnosed with Type 2 diabetes even though your weight is normal.

• Whatever your weight may be, either you or a member of your family has some other autoimmune disease such as thyroid disease, rheumatoid arthritis, lupus, or multiple sclerosis.

• You include less than 15 grams of carbohydrate foods per meal and still have a fasting blood sugar > 110 mg/dl and blood sugars that rise 40 mg/dl or more after each meal.

• Regardless of your weight, your blood sugar levels do not come down even when you take oral medication and have a lowered carbohydrate intake.

• Your blood glucose levels get worse over the period of a year despite treatment with oral drugs and carbohydrate restriction.

**Sources**
1. Diabetes Update: The LADA Epidemic. What’s Going on Here? diabetesupdate. blogspot. com/.../lada-epidemic-whats-going-on-here...
4. Diabetes LADA www. diabetes.co.uk › Diabetes Types
Painful Diabetic Neuropathy

What symptoms do people get?

Bamila S & Seena Rajsekhar
M.V. Centre for Diabetic Foot Care, Podiatry, Research & Management

Commonly reported symptoms include…

- Burning sensation as if feet are on fire
- Freezing sensation as if feet are on ice although they feel warm to touch.
- Stabbing sensation, as if from sharp knives
- Lancinating sensation like electric shocks

Abnormalities of the foot which worsen the effects of neuropathy or vascular disease…

- High Instep
- Bunions
- Rocker bottom deformity with neuropathic ulcer
- Maceration
- Clawed Toes
- Abnormal Toe nails
- Very dry skin
- Deformed toes which cause excessive pressure at the tip and at the top.

Research Focus

Research has suggested that Type 2 diabetes, commonly thought of as a purely metabolic condition may have more in common with Type 1 - an autoimmune condition where the body’s immune cells attack its own tissues. This could lead to new treatments that target the immune system instead of trying to control the blood glucose levels.

Balance Issue 3 2011.
Diabetic Nephropathy

Diabetes : Blood Sugar
Nephropathy : Kidney Disease

Sravanthi Allareddy (Research Associate)
Department of Prevention of Diabetic Kidney Disease

Diabetic Nephropathy, a complication of diabetes, is a kidney disease caused by too much sugar in the blood. High levels of sugar in the blood can damage tiny blood vessels in the kidneys, making them fail to function normally. Their functions include filtering waste products from the body, regulating the balance of electrolyte and secreting essential hormones. Therefore, patients with Diabetic Nephropathy will have problems, regarding renal function.

Untreated or poorly treated, Diabetic Nephropathy will progress to renal failure rapidly.

People who have diabetes as well as high blood pressure are at greater risk of kidney problems because uncontrolled blood pressure hastens the progress of kidney damage as shown in the figure below.

Diabetic nephropathy can occur in both:
• Type 1 diabetes
• Type 2 diabetes

Causes, incidence, and risk factors
• Each kidney is made up of hundreds of thousands of small units called nephrons. These structures filter your blood and help remove wastes from your body.
• In people with diabetes, the nephrons thicken and slowly become scarred over time. The kidneys begin to leak and protein (albumin) passes into the urine.
• Poor control of blood sugar is thought to lead to kidney damage. If you also have high blood pressure, kidney damage is even more likely.
• In some cases, your family history may also play a role.
• People with diabetes who smoke and those with type 1 diabetes that started before the age of 20 have a higher risk for kidney problems.
• People of African-American, Hispanic, and American Indian origin are also more likely to have kidney damage.

Symptoms
• Often, there are no symptoms as the kidney damage starts and slowly gets worse. Kidney damage can begin 5 to 10 years before symptoms start.
• People who have more severe kidney disease may have a poor appetite, feel tired most of the time, and have a general ill feeling.
• Headache, vomiting, swelling, and many other symptoms may also occur.
**Signs and tests**

- Once a year, people with diabetes should test their urine. The urine test looks for a protein called albumin. Because the test looks for small amounts of albumin, it is sometimes called a test for microalbuminuria. Too much protein is often a sign of kidney damage.

- High blood pressure often goes along with diabetic nephropathy. You may have high blood pressure that begins quickly or is hard to control.

**Check your kidneys with the following blood tests every year:**

- BUN
- Serum creatinine

**Other lab tests that may be done include:**

- 24-hour urine protein
- Blood levels of phosphorus, calcium, bicarbonate, PTH, and potassium

**Treatment**

- Keeping blood pressure under control (under 130/80) is one of the best ways to slow kidney damage.

- To protect kidney damage, often, the best types of medicine to use are ACE inhibitors and angiotensin receptor blockers (ARBs) such as ramipril, almisartan, etc.

- Eating a low-fat diet, taking drugs to control lipids, and getting regular exercise can also help prevent or slow kidney damage.

- Urinary tract and other infections are common, and can be treated with antibiotics.

**Diabetes Quiz**

1. **Diabetes is a condition where:**
   - A. Blood glucose is too low
   - B. Blood glucose is too high
   - C. The body stops making blood glucose

2. **People can have different types of diabetes.**
   - A. True
   - B. False

3. **You can control your blood glucose level if you:**
   - A. Make healthy food choices and are active every day
   - B. Maintain a healthy weight
   - C. Take your medicine, if needed
   - D. Check your blood glucose
   - E. All of the above

4. **People with diabetes can eat sweets and desserts.**
   - A. True
   - B. False
5. **Carbohydrate foods that are rich in fibre are:**
   A. White bread and white rice
   B. Whole grain foods and fresh fruits and vegetables
   C. Sweetened fruit drinks
   D. Sweets and desserts

6. **If you have diabetes, you should:**
   A. Get 60 minutes of physical activity every day
   B. Get 20 minutes of physical activity every week
   C. Limit your physical activity
   D. Try to walk 10,000 steps a day
   E. Both A and D

7. **A source of healthy fat in the diet is:**
   A. Chicken skin
   B. Whole milk
   C. Nuts and avocado
   D. Butter

8. **You can get enough physical activity by just:**
   A. Watching TV and playing video games
   B. Going for a walk on the weekend
   C. Swimming at the beach in the summer
   D. Being active every day in a way you enjoy

9. **People with diabetes should not eat at fast food restaurants.**
   A. True
   B. False

10. **People get type 2 diabetes because:**
    A. They have certain genes
    B. They are overweight
    C. They have a family member who has diabetes
    D. They are American Indian, Alaska Native, African American, Hispanic/Latino, Asian American, or Pacific Islander
    E. All of the above

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**Gestational Diabetes Mellitus (GDM)**

*Glucose intolerance recognized for the first time during pregnancy*

**Dr. Priya Jaiganesh MBBS, FCD**  
Dept. of GDM, MVH, Royapuram

**Causes**

Placental hormones, human placental lactogen and placental growth hormone, which are meant to shunt nutrients to the fetus, cause worsening of insulin resistance during the late 2nd trimester.

Mothers are unable to produce enough insulin to overcome the overwhelming resistance to maintain normal blood glucose levels.

**Diagnostic Criteria**

All pregnant women should undergo a 2 hour 75 gm- oral glucose tolerance test between the 24th and 28th week of pregnancy.

- Fasting – 92 mg/dl
- 1 hr - 180 mg/dl
- 2 hr - 153 mg/dl

Gestational diabetes mellitus is diagnosed if any 2 values are equal to, meet, or exceed the values given above.
Follow Up

- Every 3 weeks till 28 weeks of pregnancy
- Every 2 weeks from 29 weeks to 34 weeks of pregnancy
- Every week from 35 wks to term
- Every 2 weeks from 29 weeks to term, if not on insulin.

After Delivery

Risk factors for Type 2 Diabetes mellitus following gestational Diabetes mellitus

<table>
<thead>
<tr>
<th>Unmodifiable risk factors</th>
<th>Modifiable risk factors</th>
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<tr>
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<td>Age</td>
<td>Future weight gain</td>
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<td>Family history</td>
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<tr>
<td>Degree of hyperglycemia in pregnancy</td>
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Screening

6 – 12 weeks after delivery, a follow up of 75 gm oral glucose tolerance test (GTT) should be performed to determine the women's risk of developing diabetes and her status. If found normal, GTT should be repeated after 6 months and then after each year.

Prevention

Women who have had gestational diabetes mellitus are at a heightened risk for type 2 diabetes mellitus and so the best advice is:

- A LOW FAT DIET
- AVOIDANCE OF OBESITY
- REGULAR EXERCISE.

Answers to the Diabetes Quiz

1. B. The food you eat provides glucose which is needed for energy. However, too much glucose in your blood isn’t healthy.

2. A. In type 1 diabetes, the cells in the pancreas that make insulin are destroyed. In type 2 diabetes, the pancreas still makes some insulin but cells cannot use it very well.

3. E.

4. A. Desserts contain a lot of fat as well as sugar. If you choose to eat any of these sweet foods, just have a small amount at the end of a healthy meal. Talk to your dietitian about how you can include desserts into your meal plan.

5. B. Some carbohydrates are better than others. Fibre-rich carbohydrates such as whole grain foods and fresh fruits and vegetables are better than white bread and white rice, sweetened fruit drinks, and sugary desserts. If you eat too many carbohydrates at one time, your blood glucose may get too high.

6. E. Activity is an important part of a healthy lifestyle. It energizes, and helps you focus at work. Start slowly. Do something that you like – riding a bike, some sport, or dancing or walking. Slowly work up to at least 60 minutes every day. Use a pedometer and aim for 10,000 steps a day.

7. C. Some types of fats are better than others. A quarter cup of nuts or one slice of avocado is better than chicken skin, whole milk, and butter. Choose low-fat or nonfat milk. All fats have lots of calories, so limit the size of your portion.

8. D. Physical activity can make you feel better if you are in a bad mood or stressed out. It also helps your body use blood glucose for energy. You don’t have to play a sport or go to a gym. You can do something interesting like taking a walk or dancing with family members and friends instead of watching TV and playing video games.

9. B. You can, but only a limited quantity. Consult your dietitian.

10. E. Obesity, family genes, and race are all risk factors for diabetes.
Take Care of Your Feet

Daily foot care should include the following:

Look at your feet - every day. Look at the top and bottom of your foot. Check between your toes and around the heel area.

What to look for:

- Bruises
- Cracks/breaks in skin
- Soggy skin
- Dry skin
- Swellings/swelling in only one foot or leg
- Corns and calluses
- Ingrown toenails
- Blisters
- Sharp toe nails
- Hot/cold spots
- Discolouration
- Anything that is not normal or that was not there yesterday

Rub cream into your feet to stop them getting dry and cracked. Do not put cream between the toes. Use the cream twice a day if your feet are very dry.

A properly cut toe nail

A poorly cut toe nail

Do not cut your nails too short. Cut your nails straight across. Always check your nails for sharp edges. To smooth sharp edges use a nail file. If you are unable to cut your nails, see a podiatrist.

Consult with your Podiatrist regularly

You can get routine integrated examination for your feet at the M.V. Centre for Diabetic Foot Care, Podiatry Research and Management, Royapuram. The clinic provides education on practical aspects of foot care, early recognition of the foot at risk, advice on the selection of special footwear and comprehensive care for all diabetic foot complications.

At the M.V. Hospital for Diabetes, Royapuram, you will find a wide range of foot wear to suit your requirement including custom-built foot wear with moulded insole made at our in-house facility.

The DiaStep is a specially designed shoe made in collaboration with The Central Leather Research Institute, Chennai supported by Novo Nordisk Educational Foundation. It is suitable for diabetic patients with neuropathy, minor foot deformities and for those who have had minor foot complications.

It distributes pressure effectively, has better grip and traction, is comfortable, ensures limited joint movement and prevents foot ulcers and foot infections.

Check for Corns and Calluses (hardened skin).

Corns and calluses can be a problem. They cause pressure and can lead to ulceration. Never trim or cut a corn yourself. The only safe way to treat a corn or callus is to see a podiatrist.

Wash your feet every day using plain water and mild soap. Dry your feet well using a light coloured towel, especially between the toes. Look at the towel to make sure there is no blood or pus on it. If you can see any blood or pus tell your doctor immediately.
Standardization of HbA1c values.

The HbA1c test is an effective means of checking your long-term diabetes control, as blood glucose levels can vary throughout the day and from day to day. The test can be done every 2 – 6 months in the laboratory, as Red blood cells are replaced every 8 – 12 weeks.

As a means of standardizing the reporting of these values, the International Federation of Clinical Chemists has agreed to a new reference measurement after discussing with diabetes groups worldwide. From 1 Oct, 2011 measurements of HbA1c will be shown as ‘millimoles/ mol’ instead of the current ‘percentage’.

As genetics and family history play such an important role in a person becoming diabetic, it is quite possible to prevent it. More important than this is the fact that your lifestyle has to change. If you come from a family of diabetics, you know you are at risk, and by taking simple preventive measures like checking obesity, taking the right diet and exercise, etc., diabetes can be prevented or delayed. It is not only life but the quality of life that one is talking about; survival of a healthy being with all his functions intact."

_Dr. M. Viswanathan_ (from an article in the IndianExpress - 1994)