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Heart disease and diabetes are very common in the desi community. One disease complicates the other. Diabetes is a major risk factor for heart disease and increases morbidity and mortality in heart patients.

### **Special Cardiac Concerns**

The cardiovascular risks and outcomes in a newly diagnosed diabetic patient is equal to those of a non-diabetic patient with a heart attack. More than 75% of the deaths in diabetics are related to cardiovascular (CVS) complications. Diabetics have twice the risk of developing heart disease, compared to those without diabetes. They tend to develop these complications at an earlier age and die prematurely. The incidence of heart disease among diabetic women has been on the rise in the past few decades.

### **Accelerated Atherosclerosis**

Diabetes is more than just blood sugar control. It is a systemic disease which has a multitude of complications, including elevated lipids levels, micro and macro-vascular changes in the heart, kidneys, and brain, thus affecting many target organs. The high blood sugar is harmful to the inner lining of the blood vessels (endothelium) that leads to proliferation of smooth muscles in the arterial wall leading to increased atherosclerosis (narrowing of arteries). Diabetics also have a

higher tendency to form blood clots (increased thrombogenicity).

In addition, diabetic patients very often have high blood pressure, elevated and abnormal cholesterols, triglycerides, and inflammatory markers such as CRP. They have smaller, denser, more oxidized LDL (bad cholesterol) which is very harmful to the arterial walls. The HDL cholesterol levels are generally lower among diabetics.

All these factors increase the CVS risks. Fortunately most of these can be modified with diet and proper treatment thus underscoring the urgency.

### **Metabolic Syndrome**

Some people may not meet all the criteria for full blown diabetes, but may have several abnormalities which nevertheless increase their CVS risk. One such condition is called, "metabolic syndrome," which is defined by presence of obesity (belt size >40" in men and >35" in women); triglycerides >150 mg%, HDL < 40 mg% in men and <50 mg% in women; blood pressure >130/85 mmHg; and a fasting blood sugar >100 mg%. People who have three or more of these factors must seek medical attention to begin an aggressive treatment plan to minimize or at least delay future complications.

### **Coronary Interventions**

Diabetics have smaller coronary arteries with multiple lesions as opposed to the non-diabetics. They also have a higher incidence of totally occluded coronary arteries. They have a much higher incidence of stent restenosis after a bare metal stent insertion. The drug eluting stents may decrease restenosis. Since diabetics have multiple stenoses and diffuse disease, stents may not be a suitable choice in every patient. However, stents used in large vessels

in strategic locations may postpone the need for urgent bypass surgery.

### **Heart Surgery**

If complete revascularization is not attainable with stents, coronary artery bypass surgery may be the best option. Women with diabetes who go for heart surgery may have more complications compared with men. The incidence of sternal wound infection in diabetics is higher compared to that in non-diabetics. Strict blood sugar control may reduce the incidence of infections following surgery. The recovery following surgery is prolonged due to multiple factors such as infection, poor blood sugar control, obesity, and renal problems. Patients who have bypass surgery seem to have less cardiac symptoms after surgery as compared to those who are treated with stents. There is also evidence to suggest that the long-term survival rates in diabetics undergoing heart surgery are better compared to those who undergo coronary intervention.

### **Heart Failure**

Diabetics also have higher incidence of heart failure due to uncontrolled high blood pressure, multiple heart attacks, small coronary arteries with diffuse disease, kidney failure, and possible microvascular disease. Management of heart failure in diabetics is more challenging due to shifts in volume due to high blood sugar level and associated kidney problems.

### **Peripheral Arterial Disease (PAD)**

The incidence of PAD is much higher in diabetic. It gets worse if the patient continues to smoke. Here also, patients have diffuse disease and more critical stenoses. They do poorly with interventions such as balloon angioplasty or stents. Bypass surgery may temporarily help. It is extremely difficult to reestablish circulation in

patients with severe blockages below the knee level. In the long run, poor circulation can lead to gangrene necessitating amputation. In fact, diabetes is the leading cause for leg amputations.

### **Stroke**

People with diabetes are four times more likely to have a stroke compared to non-diabetics. Following a first stroke, the risk of a subsequent stroke increases by two to four fold.

### **Diabetes treatment.**

It is very imperative to understand the disease and take proper steps, including lifestyle modifications, diet adjustments, and exercise. Education is the key to success. Blood glucose fluctuates constantly, related mostly to diet. Home glucose monitoring is extremely important. *If you do not check, you do not know your glucose levels and if you do not know, you cannot treat.*

### **Insulin or Oral Pills?**

This depends on the patient's need—the key is to maintain a reach target blood glucose range.

Certain pills have added CVS protection while others are neutral. Insulin is often needed to control blood glucose in longstanding or poorly controlled diabetes – it should not be seen as a 'defeat'. Both pills and Insulin can cause low blood glucose or hypoglycemia and that has some added risk in patients with CVS disease, hence the need for monitoring and education to prevent such mishaps.

What is evident in the literature is that for each point drop in the HgA1c (a measure of long term blood glucose control), there is a 13% reduction in cardiovascular morbidity. Similar to cholesterol, there is a direct correlation between glucose control and the incidence of CVS complications. Hence, aggressive

control of diabetes as well as other risk factors (like blood pressure and cholesterol) has significant benefit in reducing CVS morbidity in the long run. The American Diabetes Association recommends to bring the HgA1c levels to below 7.0% but others recommend below 6.5% (normal is 6%).

The steps necessary to minimize the deadly CVS complications of diabetes depends on a team approach between you and your physicians and addressing diet, blood sugar levels, blood pressure, cholesterol levels, exercise, and weight control.

In addition, you should consider these following measures:

- *Education and knowledge*
- *Monitor BS daily*
- *Control weight*
- *Treat lipid problems*
- *Keep LDL < 80-100 mg%*
- *Keep HBA1C <6-7*
- *BP <130/80 mm Hg*
- *Daily exercise*
- *Avoid infections*
- *Aspirin and Plavix*
- *Bypass surgery better than stents*
- *ACE inhibitors for kidney protection*
- *Avoid smoking*

The American Diabetic association has taken the initiative to promote the awareness of link between diabetes and heart disease and/or stroke. Visit: [www.americanheart.org/](http://www.americanheart.org/) [www.diabetes.org/](http://www.diabetes.org/) to learn more about these and other conditions.

Visit [www.sugarlandheartcenter.com/](http://www.sugarlandheartcenter.com/) for past articles.

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